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Henry Ford Hospital Medical Bulletin

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The *Henry Ford Hospital Medical Bulletin* is furnished without charge to medical libraries, medical research laboratories, medical students, internes, residents and interested practicing physicians.

Address communications to: Chairman, Publications Committee, The Henry Ford Hospital, Detroit, Michigan.

HENRY FORD HOSPITAL MEDICAL BULLETIN

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THE HENRY FORD HOSPITAL MEDICAL ASSOCIATION

DWIGHT C. ENSIGN, M.D.*

The third meeting of the Henry Ford Hospital Medical Association was held on November 12 and 13, 1954. One hundred and fifty-two physicians registered at this meeting, and one hundred and one wives attended the reunion. There were many opportunities for renewal of old friendships at the meetings, the luncheons, and at the dinner dance which was held at the Hotel Statler on Friday evening, November 12th. The latter function was attended by two hundred fifty-seven members and wives.

The new seventeen-story clinic building was open for inspection. Although this was still incomplete, and only partially occupied at the time of the meeting, it was easy to glimpse its possibilities as far as the future of the hospital is concerned.

The business meeting was conducted by Dr. Daniel M. Brunfiel, of Saranac Lake, New York, who has been the President of the Association for the past four years. Dr. Clarke M. McColl, as Secretary-Treasurer, reported that the total number of former staff members of the Henry Ford Hospital is now 1200, with 360 members now on the staff. The new officers, elected at the last meeting of the Association, were inducted. They are: President William A. Altemeier, M.D., Cincinnati, Ohio; Vice-President Elston L. Belknap, M.D., Milwaukee, Wisconsin; Secretary-Treasurer Dwight C. Ensign, M.D., Detroit, Michigan.

Dr. Altemeier announced the appointment of the following members to the Administrative Board: William Lloyd Kemp, M.D., Birmingham, Michigan; Harry E. Schmidt, M.D., Detroit, Michigan; Joseph W. Eschbach, M.D., Dearborn, Michigan.

The scientific program on Friday was held in the New Auditorium of the hospital, while on Saturday the specialty section meetings were held in conference rooms in the New Clinic Building and elsewhere throughout the hospital. The several sessions included a wide variety of interesting and worth-while papers. Unfortunately, space does not permit inclusion of all of them in this issue of the Bulletin. From the manuscripts available, a committee has selected a number of these essays for publication, but many equally significant papers were of necessity ommitted.

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*Secretary-Treasurer, Henry Ford Hospital Medical Association

SUCCESSFUL LIGATION OF THE ANTERIOR DESCENDING BRANCH OF THE LEFT CORONARY ARTERY

W. ALBERT BREWER, M.D.*

FRED W. HOLMES, M.D.**

The purpose of this paper is to report a case of successful ligation of the anterior descending branch of the left coronary artery in a 29-year-old colored male, whose recovery has been followed by serial electrocardiograms. The case may be of interest because of information available from study of the patient in the light of the anatomical location of the surgical occlusion.

On September 16, 1950, the patient was stabbed in the chest with a paring knife. He was admitted to the emergency room of Memorial Hospital, Phoenix, Arizona, within 20 minutes of the injury. He was said to have been unconscious for a brief period before admission. When first examined, his lips were slightly cyanotic. The pulse was rapid and barely perceptible, and the blood pressure could not be obtained. Dark blood was oozing from a small puncture wound near the left edge of the stermum in the fourth intercostal space. Heart sounds were distant. The neck veins were distended. During examination, which was carried out rapidly, the patient became widely disoriented, possibly from cerebral anoxia. Pericardiocentesis was carried out immediately, yielding 150cc. of fluid blood. The blood pressure then rose to 80/50 with a pulse rate of 140 and the patient became quiet and cooperative.

He was then taken to the operating room where intra-tracheal anesthesia, using sodium pentothal, nitrous oxide, oxygen and curare, was administered. The left chest was entered through the bed of the fifth rib. Troublesome bleeding, occurring from the left internal mammary vessels, was controlled by silk ligatures. No blood was present in the left pleural space. The pericardial sac was opened, releasing 250cc. of liquid blood, with rapid improvement in the patient's general condition. No injury to the presenting surface of the heart was noted at first, but with downward traction, a 1cm. stab wound in the anterior wall of the right ventricle, just below the base of the conus arteriosus and immediately adjacent to the descending branch of the left anterior coronary vessels, began to bleed freely. At this point, ventricular fibrillation appeared, but stopped spontaneously in the matter of seconds after the traction suture at the apex was removed. Closer inspection of the cardiac wound revealed a small swelling of one of the coronary vessels, probably the artery. This was thought to be traumatic in origin and rupture here postoperatively was feared. Therefore, the vein and artery were ligated in continuity with fine silk in the lower part of their proximal one-thirds. The wound in the auricle was closed with 3 fine silk sutures. The pericardium and chest wall were closed without drainage, using silk throughout, after the instillation of 100,000 units of penicillin and 1gm. of streptomycin. At the conclusing of the operation, the blood pressure was 130/80 with a pulse rate of 110.

The vital signs showed their maximum deviation from normal about 24 hours later when the temperature was 103 degrees rectally, with pulse rate of 118 and respira-

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tory rate of 55. The temperature remained at or below 98.6 degrees after the thirteenth post-operative day. A pericardial friction rub was audible with varying degrees of intensity from the first through the fourth post-operative days. Heart sounds were considered to be of good quality at all times and no murmur was ever heard by any observer. The heart size was enlarged for about 10 days, and then gradually returned to normal. Pericardial tap on the 10th post-operative day yielded only 20cc. of liquid bloody fluid. A small sterile pleural effusion developed bilaterally, but yielded only 200cc. by thoracentesis. At least part of the fever was considered to be due to a left pneumonitis, which developed early. Alpha streptococci were demonstrated in the sputum. Response of this to penicillin was considered satisfactory. The patient was discharged in good condition on the 31st post-operative day on a restricted activity program, which he completely disregarded.

Four hundred mgm. Pronestyl was given intravenously in divided doses during surgery and in doses varying from 100 mgm. intravenously every 4 hours to 250 mgm. orally three times a day almost to the time of discharge. Except for the very brief period of ventricular fibrillation during surgery, the cardiac rhythm has remained completely regular to the present time. None of the digitalis or quinidine alkaloids were ever given or considered indicated. Ammonium chloride was given for a few days beginning on the eighth post-operative day. Except for penicillin, no other drug was used. The patient has been followed to the present time and his exercise tolerance has remained normal. The heart has remained normal in size, with normal ausculatory findings. Progress chest fluoroscopy and radiography have revealed no abnormality.

Serial electrocardiographs were taken daily for the first eight days after surgery. Thereafter graphs were taken every three days until discharge from the hospital. The figure shows only the electrocardiographs which demonstrated changes as they appeared. The early graphs did not have all the precordial leads because of the surgical dressings.

The graphs revealed early S.T. elevations in Leads 1 and 2 for four days before inversion of T waves appeared. Symmetrical inversion of the T waves in the precordial leads appeared on the second post-operative day and made progressive changes throughout the convalescent period. All precordial leads showed the changes. Noteworthy is the prompt appearance of Q3 within two days. Within eight months after ligation of the descending branch of the left coronary artery and vein, the electrocardiograph was entirely normal. The series is typical of an acute anterior myocardial infarction.

Numerous papers, discussions and reports concerning open trauma of the heart are to be found in the literature.[1,2,3,4,5,6,7,8] However, cardiac trauma, requiring coronary ligation or with direct injury to the coronary vessels themselves, apparently is not common. Davenport[9] reported closing a 5mm. puncture wound of the right ventrical in the upper part of the middle one-third of its anterior wall, requiring ligation of the interventricular branch of the left coronary artery and vein. The patient, a 44-year-old white male, was ambulatory on the thirteenth post-operative day and returned to work two weeks later.

Davenport, Blumethal and Cantril[10] also reported survival of a 32-year-old colored male after suture of a wound of the left ventricle near the apex with ligation of the

coronary vessels. He returned to work as a truck driver without disability 1 month after injury.

In 1931, Elkin and Phillips[11] reported repair of a wound in the right ventricle with severance of the anterior descending branch of the left coronary artery at about its mid-point. The patient, an 18-year-old colored male, survived closure of the wound and ligation of the coronary artery. A pericardial friction rub was audible between the third and sixth post-operative days with x-ray evidence of pericardial effusion and pneumonia on the fourth day. The authors also reported a colored male, age 25, with a 1.5cm. laceration of the left ventricle just to the left of the coronary vessels in their distal one-third. The wound was sutured without injury to the vessels and the patient recovered. Pericardial effusion and pneumonia also developed on the fourth post-operative day.

Porter and Bigger[12] reported a colored male, age 23 years, with a 1cm. stab wound through the descending branch of the circumflex artery into the left ventricle about 5cm. from the apex. The wound was closed and the artery ligated without difficulty The patient was discharged in good condition on the sixteenth post-operative day and subsequently returned to work as a laborer. Follow up physical examination, chest x-ray and electrocardiographs were all normal.

Olim and Hughes[13] closed a 1.5cm. laceration of the left ventricle 5cm. from the apex in a moribund 24-year-old colored male. The coronary vessels were ligated as the wound was closed. No cyanosis of the distal cardiac muscle was observed. The patient made a complete recovery. Beginning on the third post-operative day, a loud systolic murmur with apical systolic thrill was audible and persisted throughout the period of observation. There was no accompanying cardiac dilatation. The authors thought there might have been an injury to a valve leaflet, a chorda tendina, or a papillary muscle. This is the only report of post-operative murmur that we have encountered.

Badertscher[14] has reported 3 cases of cardiac compression due to acute dilatation of the heart resulting from cardiac wounds. One of these was a 20-year-old colored female with a 6mm. laceration of the right ventricle immediately adjacent and parallel to the left anterior descending coronary vessels. The wound was closed without direct ligation of the vessels, but was occluded by an inverting effect of the muscle sutures, which were placed rapidly because of very severe hemorrhage. Increasing cyanosis of the heart muscle progressing toward the apex was noted. The patient's general condition improved rapidly, however, and the incision was closed. As the skin was being sutured 25 minutes later the blood pressure became imperceptible. Fearing recurrence of the hemorrhage, the incision was reopened and the heart fairly popped out of the pericardial sac under great tension due to enormous dilatation, but with no suggestion of bleeding. The blood pressure immediately rose to 160/120. Cardiac action became tumultuous causing several lacerations of the anterior surface of the organ on the overlying rib edges. Hemorrhage from these lacerations was uncontrollable and death occurred 45 minutes after the coronary occlusion.

The other 2 cases were stab wounds of the left anterior chest with signs of cardiac tamponade, but without evidence of penetration of the pericardium or heart. Both were relieved clinically by opening the pericardial sac alone, and both recovered.

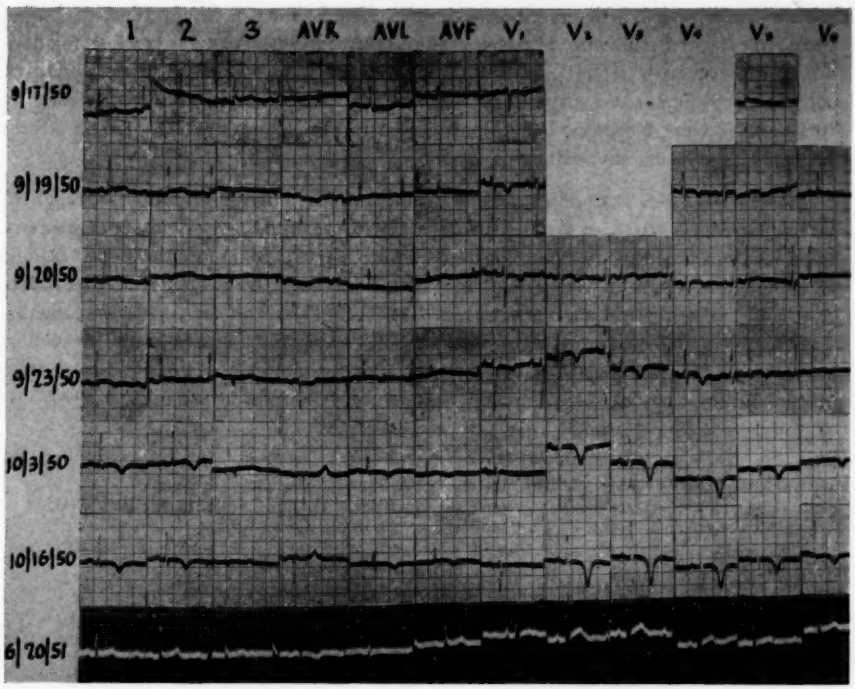
Zerbini[15] treated a 6-year-old male, who was injured by an iron splinter, with pneumothorax and cardiac tamponade. The right ventricle and anterior descending branch of the left coronary artery were wounded 4cm. from the apex. Repair was carried out without difficulty and recovery was very smooth. Progress electrocardiographs showed evidence of pericarditis but not of infarction. The child was well one year later with no evidence of diminution of cardiac reserve.

This is the only case on record without evidence of infarction, either clinically or by electrocardiograph, that we have encountered. As a matter of fact, clinical infarction not uncommonly follows cardiac trauma without associated coronary injury. Zerbini feels that this is due to the anatomic and functional condition of the capillary network at the time of injury, since the coronary arteries are purportedly end arteries. Injection studies[16,17] have shown small anastomotic vascular channels between adjacent branches of the same coronary artery, between the coronary arteries and coronary veins, and between branches of the coronary veins themselves. In addition, there are venous channels which empty directly into the cardiac chambers, the thebesian veins or vena cordis minimae. More recently, direct connections between the coronary arteries and cardiac chambers, or so-called arterio-luminal vessels, have been described.[18,19] Therefore, if these vessels were to dilate, a free collateral coronary circulation would be established. Such dilatation conceivably would occur more easily in a 6-year-old child than an adult. Probably the coronary arteries do act as end arteries in the usual sudden occlusion with infarction. That dilatation of anastomotic channels does take place with gradual coronary occlusion is well known. This was particularly well shown by two cases of complete occlusion of both coronary arteries at their aortic origins by syphilis, reported by Leary and Wearn.[20] These patients were able to carry on active lives.

Beck and Mako[21] have studied this problem experimentally in dogs. They injected solutions into the right and circumflex coronary arteries after ligation of the anterior descending branch of the left coronary. Good filling in the distal portion of the occluded artery was demonstrated in all hearts surviving ligation. Better filling was noted after ligation of both artery and vein than after ligation of the artery alone. They were able to reduce the average mortality of 80%, if the accompanying vein were simultaneously ligated.

We were impressed with the survival and relatively smooth course of our patient from the standpoint of the level of ligation, which is possibly the most proximal ligation with survival yet reported. Graham and Laforet[22] have reported two ligations of the main left coronary artery in the atrioventricular groove. One of these patients died immediately, the other in 36 hours, of a cerebral embolus. Both ligations were occasioned by accidental tears of the left auricle into the atrioventricular groove during finger valvloplasty for mitral stenosis. At autopsy the first case showed an early infarct at the apex; the second an early infarct of the wall of the left ventricle.

Allen and Laadt[23] have shown nicely that the mortality rate following sudden occlusion in the dog is inversely proportional to the number of arterial branches proximal to the occlusion. They have also shown that the mortality is directly proportional to the percentage of blood flow of the total coronary circulation carried by the occluded artery. In the human, the left anterior descending branch of the left coronary apparently



REPRESENTATIVE CARDIOGRAPHS—PATIENT WITH HEART INJURY

does not carry a critical flow, as judged by the survival of all patients cited above except the one in which case death was actually due to exsanguinating hemorrhage from the ventricle itself.

Perhaps this amazingly low mortality was also influenced by the anesthesia. Manning, McEachern and Hall[24] have shown that the high mortality following acute occlusion of one branch of a coronary artery in the conscious dog cannot be accounted for by the extent of the experimentally produced infarct. They suggest that this mortality is the result of a relatively large area of ischemia brought about by spasm of collateral arterial branches. For example, ligation of the left anterior descending branch of the left coronary one-half inch from the aorta in the anesthetized dog resulted in 6% mortality in their hands, while ligation at the same level in the conscious animal produced a 32% mortality. Figures for ligation of the circumflex branch were 26% and 75%, respectively.

The absence of cardiac pain following coronary ligation in our patients was surprising. Other observers have mentioned this in relation to both coronary trauma and to wounds of the heart musculature. Porter and Bigger[12] noted it in their two patients. They felt that while myocardial ischemia was of major importance in the pathogenesis of pain, it would not occur if the ischemic area contained muscle that had lost its power of contractility, as would be produced by an incised wound or by the sutures in closing such a wound. With severance and ligation of a coronary artery, one would

expect a latent period to intervene between the trauma and loss of contractility, during which typical heart pain would be manifest. Perhaps pain fibers travel in close relationship to the coronary vessels and are interrupted by such trauma. The possibility of such a neurogenic basis is suggested by the observations of Sutton and Lueth (cited by Porter and Bigger) who found that pain was not produced in dogs if the continuity of the vessel or even its adventitia was broken.

SUMMARY: A case of successful ligation of the anterior descending branch of the left coronary artery in a 29-year-old male is presented. After pericardiocentesis, the patient was taken to the operating room where a 1 cm. wound of the right ventricle just below the conus arteriosus and immediately adjacent to the anterior descending branch of the coronary artery was found. The coronary artery and vein were ligated in continuity and the ventricular wound closed. The patient made a complete clinical recovery and has returned to heavy physical labor. Serial electrocardiographs showed a typical anterior myocardial infarction with return to normal in 8 months.

BIBLIOGRAPHY

1. Bigger, I. A.: Diagnosis of heart wounds, South. M.J. 29:18, 1936.

2. Bigger, I. A.: Heart wounds; report of 17 patients operated upon in Medical College of Virginia hopitals and dicussion of treatment and prognosis, J. Thoracic Surg. 8:239, 1939.

3. Elkin, D. C.: Diagnosis and treatment of wounds of heart; review of 22 cases, J.A.M.A. 111: 1750, 1938.

4. Elkin, D. C.: Diagnosis and treatment of cardiac trauma, Ann. Surg. 114:169, 1941.

5. Elkin, D. C.: Wounds of the heart, Ann. Surg. 120:817, 1944.

6. Cameron, D. A., O'Rourke, P. V., and Burt, C. W.: Management of penetrating and perforating wounds of the chest in civilian practice, Am. J. Surg. 79:361, 1950.

7. Ravitch, M. M., and Blalock, A.: Aspiration of blood from the pericardium in treatment of acute cardiac tamponade after injury; further experience, with report of case, Arch. Surg. 58:463, 1949.

8. Samson, P. C.: Battle wounds and injuries of heart and pericardium; experiences in forward hospitals, Ann. Surg. 127:1127, 1948.

9. Davenport, G. L.: Suture of wound of heart; ligating the interventricular branch of left coronary artery and vein, J.A.M.A. 82:1840, 1924.

10. Davenport, G. L., Blumenthal, B., and Cantril, S.: Electrocardiographic studies of a stab wound of the heart, J. Thoracic Surg. 5:208, 1935.

11. Elkin, D. C., and Phillips, H. S.: Stab wound of the heart—electrocardiographic studies of 2 cases, J. Thoracic Surg. 1:113, 1931.

12. Porter, W. B., and Bigger, I. A.: Nonfatal stab wounds of the ventricles, with electrocardiographic signs of coronary thrombosis and absence of anginal pain, Am. J. M. Sc. 184:799, 1932.

13. Olim, C. B., and Hughes, J. D.: Stab wound of the heart with coronary ligation, J. Thoracic Surg. 9:99, 1939.

14. Badertscher, V. A.: Acute cardiac compression resulting from restraining influence of pericardium during acute dilatation of the heart; observation of 3 cases during pericardial exploration, Am. J. Surg. 50:367, 1940.

15. Zerbini, E. de J.: Coronary ligation in wounds of the heart; report of case in which ligation of anterior descending branch of left coronary artery was followed by complete recovery, J. Thoracic Surg. 12:642, 1943.

16. Schlesinger, M. J.: Injection plus dissection study of coronary artery occlusions and anastomoses, Am. Heart J. 15:528, 1938.

17. Prinzmetal, M., Simkin, B., Bergman, H. C., and Kruger, H. E.: Studies on coronary circulation; collateral circulation of normal human heart by coronary perfusion with radioactive erythrocytes and glass spheres, Am. Heart J. 33:420, 1947.

18. Wearn, J. T.: Role of thebesian vessels in circulation of heart, J. Exper. Med. 47:293, 1928.

19. Wearn, J. T., Mettier, S. R., Klumpp, T. G., and Zschiesche, L. J.: Nature of vascular communications between coronary arteries and chambers of heart, Am. Heart J. 9:143, 1933.

20. Leary, T., and Wearn, J. T.: Two cases of complete occlusion of both coronary orifices, Am. Heart J. 5:412, 1930.

21. Beck, C. S., and Mako, A. E.: Venous stasis in coronary circulation; experimental study, Am. Heart J. 21:767, 1941.

22. Graham, G. K., and Laforet, E. G.: Electrocardiographic and morphologic study of changes following ligation of left coronary artery in human beings; report of 2 cases, Am. Heart J. 43:42, 1952.

23. Allen, J. B., Laadt, J. R.: Effect of level of ligature on mortality following ligation of circumflex coronary artery in dog, Am. Heart J. 39:273, 1950.

24. Manning, B. W., McEachern, C. G., and Hall, G. E.: Reflex coronary artery spasm following sudden occlusion of other coronary branches, Arch. Int. Med. 64:661, 1939.

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EIGHTEEN YEARS EXPERIENCE IN REHABILITATION

DANIEL M. BRUMFIEL, M.D.*

Last summer the President signed certain amended Federal Acts passed by Congress and gave national recognition to rehabilitation and the promise of widened support to one of the modern, great, medical movements.

There has been a wave of awareness in the medical profession that our job is not done when we have but helped the patient recover from his disease; that our responsibility does not end with the restoration of his cardiac compensation, the healing of his wound, the clearing of his chest x-ray, or the amputation of his mangled hand. He is still our problem until we get him back to work—if not at his former occupation, then in some other.

The soundness of this argument is illustrated by this presentation which might be called "A Case History of a Rehabilitation Center."

In 1936 a small group of interested and far-sighted individuals in Saranac Lake set up a plan to provide purposeful diversion to assist in treating tuberculosis. At first the project was one of strictly adult education. The courses offered were chiefly Academic, Arts and Crafts and Business Education. In a preliminary survey two-thirds of the patients who expressed a desire for instruction asked for formal study, one-third for crafts. One-third of the whole group indicated concern with training for a new occupation. The new, private membership organization was chartered under the name of "The Saranac Lake Study and Craft Guild."

Within two months of the start of organized instruction, there were enrolled 186 students studying under a faculty of 16, of whom 9 were patients, 5 ex-patients and 2 were non-tuberculous.

Instruction was individual at the bedside for the confined person and in central classrooms and workshops for the non-confined. From the beginning, well members of the community were admitted to classes when space was available. All concerned are convinced that this was a very wise and far-seeing move in the success of the Guild in its purpose of rehabilitation. In studying and working alongside healthy persons, in cooperation and in competition with them, the disabled person gains confidence that he can compete and avoids the feeling of being a "man apart," a self-stigmatized rehabilitee, when he goes back into his industrial, business or professional environment.

Late in 1938, the teachers became indirectly the employees of the State and subject to certification by the State Department of Education. This recognition enhanced the prestige of the Guild and assured it of professional assistance and supervision.

In 1939 the necessity of professional counseling and guidance for the individual was recognized, if the maximal benefit was to be obtained. The establishment of a Department of Rehabilitation Counseling is seen in retrospect as the first, long step from a primarily diversional and therapeutic program toward the development of the comprehensive rehabilitation center of today.

The character of the educational program began to change. The Arts and Crafts Department started graduating professional craftsmen; the Academic Department be-

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came concerned with helping its students gain High School and College credits; the Business Education Department prepared young people for Civil Service examinations; a Reader's Advisory Service, in cooperation with local and State libraries, served many who wished to extend their vocational knowledge while still confined to bed.

The new emphasis bore particular fruit in the Technical Education Department. In 1943 the Tuberculosis Control Division of the U.S. Public Health Service proposed that properly selected, ex-tuberculosis patients be trained as photofluorographic technicians to serve in the extensive case-finding program then being initiated. With co-sponsorship of the U.S. Public Health Service and the Federal Office of Vocational Rehabilitation, the proposed course was set up under the auspices of the Guild. The first class was admitted in October 1943. In October 1953, the Guild graduated its fifty-sixth class of operators, having enrolled in the ten years period, 496 trainees from 42 states and 6 foreign countries.

Three years ago it was suggested by some people interested in Vocational Rehabilitation that the Guild offer a full year's training course for X-ray Technicians to be employed in hospitals. It was pointed out that in many of the places where such courses were being given, the rehabilitee was not under close medical supervision nor did he have the advantages of counseling. Two or more classes are admitted each year. They receive their technical instruction in the Guild classrooms and are assigned to the X-ray Departments of cooperating hospitals and sanatoria in the area for their "on-the-job" practical training.

These classes illustrate the constantly broadening categories of disability which the Guild is serving; no longer are they all ex-tuberculosis patients. Applications for the class which entered in September include 4 cardiacs and other disabilities from just one of our neighboring states. The class of 8 which graduated Dec. 21, 1954 was composed of 2 ex-tuberculosis individuals; 4 cardiacs; 1 spastic and 1 with a visual defect.

In 1951 the gift of a thirty room hospital building provided much needed room for offices, classrooms and a sheltered workshop which is affiliated with the famous Altro Work Shops of New York City. This provides graduated work at union rates on medical prescription. Nor is it limited to those handicapped by tuberculosis. One young woman, hopelessly crippled by rheumatoid arthritis, came for physical and occupational therapy and stayed to earn the first dollars that she had ever owned.

Prior to 1952, persons in need of physical and occupational therapy in the Northern New York area must be referred to some distance for these benefits—Montreal, Albany, Syracuse. Upon the urging of physicians of the area, particularly the Orthopedists, a Department of Physical Therapy was set up and a trained Physical Therapist was brought in. A few months later the Department of Occupational Therapy was established, also with a trained Occupational Therapist in charge. All patients served by these departments receive their treatments on prescription of the attending physician. So far, every conceivable type of disability has been take ncare of, except the bedfast paralytic requiring nursing care. Such service may be in the future.

Through the cooperation of the Guild Physical Therapist and the Physiology Department of the Trudeau Sanatorium, a study is being carried out on the effect of special breathing exercises for those disabled by emphysema. Some surprising clinical benefits have been observed.

The institution of the departments just mentioned necessitated the formation of a Medical Advisory Committee and the employment of a part-time Medical Supervisor.

The Medical Committee comprises practicing physicians, surgeons, sanatorium directors and a psychiatrist.

Other Advisory Committees are each concerned with the supervision of some phase of the Guild's activities:—The Education Committee, traditionally headed by the superintendent of schools; the Counseling Committee, headed by the medical director of the near-by State Hospital; and the Research and Evaluation Committee, whose chairman is a practitioner of wide note and who also directs one of the Sanatoria in the area.

The Board of Directors, twenty-five in number, is made up of business and professional men, with representation from organized labor and industry. Many of the directors have, themselves, been rehabilitated. Traditionally, the office of president has been held by a physician.

A Women Auxiliary of from 60 to 70 volunteer members provides some social life for those undergoing rehabilitation.

You will note that throughout this, perhaps tedious, recital, each new department, each expansion of services, was undertaken to fill an already existing need. The Guild was started and has grown, by request, if you will. It has been a project developed by the integration of the facilities of the community. By 1952 it became obvious that the Guild could not do some of the things which it needed to do and, perhaps, some of those which it had already done, under its original charter. The charter was revised to meet the up-to-date needs and the name changed to express its broadened purposes:—"The Saranac Lake Rehabilitation Guild."

Rehabilitation means many different things to many people. To some, it means little more than physical restoration—to bake a stiff joint, stretch a spastic muscle, teach the hemiplegic to walk again, cut his meat and button his clothes. To others, it is strictly vocational—to teach the afflicted a new occupation commensurate with his physical and mental powers. (Most publicly supported vocational rehabilitation agencies require a stated number of proved work-tolerance hours before accepting a candidate.) To some, it means a sheltered workshop where the disabled may occupy herself with some remuneration on her way to full rehabilitation, or where the handicapped may obtain employment within the limits of that handicap. To some, it means developing new skills, or enhancing old ones, that may be used for advancement in the old occupation which is to be resumed.

But to everyone concerned with the Saranac Lake Rehabilitation Guild, and to those connected with the other twenty-two comprehensive rehabilitation centers in the country, it means the full coordination and integration of all the facilities to the maximal benefit of each disabled individual.

Eighteen years of experience has convinced this community that the time to start rehabilitation is as soon as medically feasible after the diagnosis has been made; that in all but very short-term disabilities, the coordinated services of various departments are important; and that it is of distinct advantage to the rehabilitating individual to work in the company of well persons.

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EXPERIMENTAL TREATMENT OF TYPHOID CARRIERS

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The problems presented by the typhoid carrier have been excellently described in the report of the Study Group on Typhoid Fever of the American Public Health Association[1]. This report calls attention to the large number of typhoid carriers, usually persons past middle age, who became carriers during a time when laboratory diagnosis and treatment of the disease was on a somewhat less firm footing than we now practice. At the time of that report[1] it was assumed that from 3 to 5 per cent of cases of typhoid fever became chronic carriers. The Study Group on Typhoid Fever[1] pointed out that there are many more typhoid carriers in an area than the actual number of acute typhoid cases reported during the year. Since a carrier should be proved to be such for a period of twelve months before classification, our present rate of carrier acquisition is not known, particularly since the more recent successful antibiotic treatment of acute typhoid fever. Most typhoid fever cases can be traced to carriers; therefore, it would be desirable to reduce to a minimum those who are carriers, serving as a focus of infection for susceptibles.

It has been shown by experience that Chloromycetin® does not reverse the bacteriology of stools in typhoid carrier states.[2,3,4,5,6,17,18,19] A combined regimen of Chloromycetin before and after cholecystectomy has been reported in one instance as successful.[20] Several instances of successful treatment of urinary carriers of typhoid with Chloromycetin have been published.[7,8,9,21] The duration of the carrier states prior to Chloromycetin treatment has not been stressed in published reports, and it is not clear as to whether some of the carriers may be relapses following inadequate treatment, or carriers of long duration.

Efforts have been made to decrease the relapse rate by utilization of Chloromycetin in interrupted dose schedules[10,11] and by concomitant schedules of Chloromycetin and typhoid vaccine.[11,12,13]

Development of strain resistance has not been thought to be responsible for relapse rates since patients in relapse after unsuccessful Chloromycetin therapy have responded with subsequent courses of adequate treatment.[14,15] One report[22] furnishes evidence of increased resistance of from 12.5 to 35.0 mcg. per ml. by in vitro technic following a course of Chloromycetin. Other references to such resistance increase have not been found. However, the in vitro evidence might well be explored.

This study was designed to test the theory that the original failure of the immune response, resulting in a host-pathogen carrier state, could be altered by serial doses of a bacterial antigen. When sufficient time had elapsed for cellular response, plans were made to use a specific antibiotic to which the pathogen was sensitive, thus overlapping active immunization and chemotherapy.

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Typhoid carriers in three closed institutions were selected for this study. These patients included carriers of known history and those located during routine stool culture surveys. Supervision of treatment and bacteriologic followup was thorough because of long term patient assignment at the respective institutions. Seven carriers were treated between April, 1950, and April, 1953. Each had been confirmed bacteriologically with not less than three successive positive stool cultures.* All carriers were isolated in accordance with the regulations of the Michigan Department of Health. Sensitivity tests with Chloromycetin were performed by the serial dilution method.** Blood serum was obtained for agglutination tests, prior to beginning the vaccine course and just prior to each vaccination.

Each patient received 5 weekly injections of Typhoid Vaccine, intramuscularly.*** (Two received 0.5 ml. doses; five received 1.0 ml. doses.) Agglutinin "H" titers**** were determined just prior to each vaccine injection, and weekly for several weeks after the last dose of vaccine. At the end of the 4th week of vaccine therapy, Chloromycetin was begun and continued for 14 days. Two patients received about 50 mgm./Kg./day, orally, in divided doses. Four patients received 100 mgm./Kg./day in divided doses for 5 days, 75 mgm./Kg./day for 5 days, and 50 mgm./Kg./day for 4 days, and one received 100 mgm./Kg./day for 14 days. One gram of the total daily dose was administered intravenously during the first 10 days of treatment of these latter five patients. All other doses of the drug were given orally. General supportive therapy consisted of the injection of vitamin B-complex and vitamins C and K, daily, throughout the course of drug therapy. No special dietary orders were given. Blood cell counts and urinalyses were done during treatment and for several weeks following completion of the antibiotic schedule. Stool specimens were obtained and cultures made weekly for at least 12 weeks following completion of treatment, after which cultures were made of two specimens of bile secured by drainage if conditions permitted. Stool cultures were obtained at subsequent intervals on all remaining patients.

Table I presents data on seven patients, six of whom were past 60 years of age. Two patients had bacteriologic confirmation as carriers for periods greater than 12 months; five were known as carriers for one month, having been discovered in routine stool culture surveys. Since there is no history of acute febrile illness in any of these patients, it is probable that all were typhoid carriers for periods in excess of 12 months. Five tested strains were sensitive to Chloromycetin at ranges of 1.0 to 2.5 mcg./ml. of culture media. This degree of sensitivity is comparable to the experience of others.[16]

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*All stool cultures in this study were conducted by the Michigan Department of Health through the courtesy of G. D. Cummings, M.D., Director of Laboratories.

**Sensitivity tests were conducted by A. S. Schlingmann, D.V.M., and Miss Mary Manning, Research Laboratories, Parke, Davis & Company, Detroit, Michigan.

***Typhoid Vaccine, 1000 mil. per ml., Parke-Davis. Prepared for commercial distribution from Panama strain supplied by the Army Medical School; released on basis of potency test as recommended by the National Institutes of Health.

****Antigen made by washing an 18-hour growth of Salmonella typhi, 04425, 42-A-58, Panama from veal agar with buffered diluent containing 0.4 per cent formalin. Standardized to contain about 2000 mil. per ml.

TABLE I

Patient	Age	Wt.	Carrier history months	Strain sensitivity mcg./ml.	Vaccine weekly X 5	Chloromycetin mgm./kg./day orally	for Days
P.R.	75	114	24	2.5-5.0	0.5	50	9
L.D.	71	157	22	0.75	0.5	50	14
La.	72	255	1	2.5	1.0	100*	5
						75*	5
						50	4
L.C.	77	147	1		1.0	100*	5
						75*	5
						50	4
A.Sh.	73	110	1		1.0	100*	5
						75*	5
						50	4
Th.	46	149	1	2.5	1.0	100*	5
						75*	5
						50	5
A.Se.	77	120	1	1.0	1.0	100*	14

Table II records the highest "H" agglutinin titers with respect to the five weeks of active immunization. Rise in "H" agglutinins appeared by the end of the 2nd to 3rd week in 6 patients. One patient did not reach peak titer until the 5th week. The pattern of response was not consistent.

TABLE II

Patient	Vaccine weekly X 5	Inital titer	Highest titers by weeks 1	2	3	4	5
P.R.	0.5	200		1000			
L.D.	0.5	200		2500			
La.	1.0	100			500		
L.C.	1.0	100		1000			
A.Sh.	1.00	100					1000
Th.	1.0	200				1000	
A.Se.	1.0	200			5000		

Table III summarizes the bacteriologic results of stool and bile examinations, computed in weeks following the completion of typhoid vaccine and Chloromycetin treatment. Patient P.R. was not treated past the 9th day because of acute urinary tract infection. Two patients (La. and Th.) failed to respond to the first regimen. Cholecystectomies were performed on both patients, and in each instance stool cultures continued to reveal S. typhosa. A second course of bacterial antigen and Chloromycetin therapy reversed the bacteriology during the period of study (70 and 45 weeks respectively). Stool reversals occurred in four patients after a single course of therapy. Negative bile cultures were obtained in three patients of this latter group.

*1.0 gm. I.V. first 10 days.

TABLE III

Pt.	Stools — Cultures, by weeks, after treatment	Bile	Neg. stool per.—wks.
P.R.	—/5 +/6 +/7 +/8 +/9 +/10 +/12 +/14 +/16 +/45	Not done	None
L.D.	—/5 /—6 —/7 —/8 —/9 —/10 —/11 —/12 —/14 —/15 —/16 —/18 —/20 —/41	—/22 —/23	41
La. 1st	+/6 +/7 +/9 +/12		
2nd	—/1 —/2 —/3 —/5 —/6 —/7 —/8 —/10 —/11 —/12 —/14 —/26 —/33 —/44 —/50 —/70	Chol 1-10-52 Bile +	70
L.C.	—/1 —/3 —/4 —/5 —/6 —/7 —/8 —/9 —/10 —/11 —/12 —/12 —/16 —/13 —/14 —/15 —/38 —/44		44
A.Sh.	—/1 —/2 —/3 —/4 —/5 —/6 —/7 —/8 —/9 —/11 —/12 —/14 —/15 —/13 —/14 —/15 —/32 —/40		40
Th. 1st	+/1 +/2 +/3 (Chol) +/4 +/5 —/6 —/7 +/8 +/9	Chol 1-29-52	45
2nd	—/1 —/2 —/3 —/4 —/5 —/6 —/7 —/8 —/9 —/10 —/12 —/13 —/14 —/24 —/25 —/28 —/32 —/40 —/45	Bile +	
A.Se.	+/1 —/2 —/3 —/4 —/5 —/6 —/7 —/8 —/9 —/10 —/11 —/12 —/13	Not done	13

Table IV presents the 7 cases listed in 3 groups: (1) failure, treatment not completed; (2) four successful responses following a single course of therapy; (3) primary treatment failure, followed by cholecystectomy, responding satisfactorily to a second regimen of vaccine and Chloromycetin. The present patient status is given, and a summary of negative stool observations is listed.

TABLE IV

Group	Pt.	Date treated	Results	No. Treatments	Negative Stools Weeks	Remarks
1	P.R.	4-17-50	Failure	1 (incomplete)	None	Living—age 79
2	L.D.	4-17-50	Success	1	41	Exp. 8-20-52, pneumonia
	L.C.	9-2-51	Success	1	44	Living—age 81
	A.Sh.	10-15-51	Success	1	40	Exp. 1-10-54, lobar pneumonia
	A.Se.	4-21-53	Success	1	13	Exp. 5-1-54, coronary occlusion
3	La.	9-18-50	Failure			Chole 1-10-52 Bile +
		3-10-52	Success	2	70	Living and well
	Th.	12-5-51	Failure			Chole 1-29-52 Bile +
		3-5-52	Success	2	45	Paroled 4-10-53 Lost to follow-up

Blood cell counts including differential leukocyte counts were made prior to, during, and following each treatment schedule. At no time were there variations in values which suggested depression of the hematopoietic system. A marked leukocytosis

was observed during period of urinary tract infection in one patient (P.R.); urine examinations reflected an infectious process in this patient. Urinalyses from the remaining six patients were not unusual.

DISCUSSION

The mechanism by which the reversal of stool cultures occurred in this group of typhoid carriers is not understood. It is hoped that we may have stimulated host defenses to a degree that made antibiotic therapy more effective. It is not known whether another type of antigen might also serve to stimulate defense mechanisms under conditions such as these reported. This approach in treatment might bear further investigation in other infections which tend to become chronic and to result in host-pathogen carrier states. If modern treatment with chemotherapeutic agents tends to shield the host defense mechanisms from normal responses, it may become necessary to stimulate host defenses as an additional aid in treatment regimens.

SUMMARY

1. A series of seven patients in the typhoid carrier state was treated with typhoid vaccine and Chloromycetin. There were four primary successes; two responded satisfactorily to a second course of treatment, preceded by cholecystectomy, and one patient, a treatment failure, did not complete the total course of antibiotic.

2. Our results would seem superior to those reported by investigators who have used drug therapy alone in typhoid carriers.

3. The importance of host immunity is discussed.

We wish to express our thanks to the following persons whose cooperation and encouragement during this study is appreciated: E. A. Sharp, M.D., Director, Department of Clinical Investigation, Parke, Davis & Company, Detroit, Michigan; O. R. Yoder, M.D., Medical Superintendent, Ypsilanti State Hospital, Ypsilanti, Michigan; Russell L. Finch, M.D., formerly Medical Director, Michigan Department of Corrections, Jackson, Michigan.

REFERENCES

1. Feemster, R. F., and others: The control of typhoid carriers, Am. J. Pub. Health Year Book, 39:71, 1949.

2. Le Riche, H., and Peacock, P. N. B.: Typhoid fever in South Africa; treatment of 215 cases without chloromycetin and 139 with chloromycetin (chloramphenicol), South African M.J. 25:921, 1951.

3. Rumball, C. A., and Moore, L. G.: Treatment of chronic typhoid carrier with chloromycetin, Brit. M.J. 1:943, 1949.

4. Gaub, W. H.: An epidemic of typhoid fever at Spenard, Alaska, J. Lab. & Clin. Med. 37:931, 1951.

5. Douglas, A. D. M., and Hubbard, D. C.: Penicillin and sulphamerazine in treatment of typhoid carriers, Brit. M.J. 1:124, 1951.

6. Sedallian, S., and others: La chloramphenicol dans le traitement de la fievre typhoide, J. med. Lyon 31:627, 1950. *Abst* J.A.M.A. 144:1215, 1950.

7. Lewin, W., Bersohn, I., Gaylis, B., and Mundel, B.: Chronic typhoid urinary carrier cured with chloromycetin, South African M.J. 25:621, 1951.

8. Kennedy, J. M., and Millar, E. L. M.: Paratyphoid urinary carrier treated with chloramphenicol, Lancet 1:92, 1951.

9. McLintock, J. S.: Report on a urinary typhoid carrier treated by chloromycetin, M. J. Malaya 5:80, 1950.

10. John, A. T., and Vinayagam, V. S.: Effect of interrupted courses of chloramphenicol on relapse-rate in typhoid fever. Lancet 2:757, 1952.

11. Woodward, T. E., Smadel, J. S., and Parker, R. T.: The therapy of typhoid fever, M. Clin. North America 38:577, 1954.

12. Rapellini, M., and di Nola, F.: La terapia vaccino-antibiotica nella febbre tifoide, Minerva med. 2:107, 1951.

13. Laporte, A., Fritel, D., Ricordeau, G., and Betourne, C.: Le probleme des rechutes dans les fievres typhoides et paratyphoides traitees par la chloromycetine, Presse med. 58:989, 1950.

14. Woodward, T. E., Smadel, J. E., and Ley, H. L., Jr.: Chloramphenicol and other antibiotics in treatment of typhoid fever and typhoid carriers, J. Clin. Investigation 29:87, 1950.

15. Balim, A. I., and Gronbeck, C.: Typhoid fever epidemic involving immunized soldiers, U. S. Armed Forces M. J. 5:68, 1954.

16. McLean, I. W., Jr., Schwab, J. L., Hillegas, A. B., and Schlingman, A. S.: Symposium on antibiotics; susceptibility of micro-organisms to chloramphenicol (chloromycetin), J. Clin. Investigation 28:953, 1949.

17. Crocker, T. T., and Gelperin, A.: Treatment of the typhoid carrier state with chloramphenicol, Yale J. Biol. & Med. 23:119, 1950.

18. Vaichulis, J. A., and others: The chronic typhoid carrier. III. Therapy with antagonistic bacillus, antibiotics and sulfonamides, Ann. Int. Med. 33:361, 1950.

19. Collins, H. S., and Finland, M.: Treatment of typhoid fever with chloromycetin. Results in 4 cases and in a chronic carrier, New England J. Med. 241:556, 1949.

20. Acton, W. C., Cottrell, J. D., and Davis, R. G.: Treatment of typhoid carriers, Canad. M. A. J. 67:256, 1952.

21. Miller, W. S., and Floyd, T. M.: Chronic urinary salmonella carriers, Lancet 1:343, 1954.

2. Colquhoun, J., and Weetch, R. S.: Resistance to chloramphenicol developing during treatment of typhoid fever, Lancet 2:621, 1950.

LESSONS LEARNED FROM THE DETROIT TRANSMISSION DIVISION FIRE OF AUGUST 12, 1953

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For years all of us have been aware of the importance of preparedness for disaster. Most of us have received considerable training in this field. It was especially encouraging to find that during the Livonia fire our plant medical staff was instructed to meet a disaster.

On August 12, 1953, at 3:48 P.M., began probably the most destructive fire in the history of American industry. Within a half hour the General Motors plant at Livonia was an inferno. The many fire departments were unable to bring the fire under control until the plant was a total loss. No one had believed that this modern fireproof building could burn.

The fire was started by a welder's spark which ignited a kerosene-like rust-proofing material in a drip-pan under a conveyor about 12 feet above the floor. Due to the difficulty of fighting a fire so high above the floor, it soon spread rapidly.

By 4 P.M. some men who had been fighting the fire reported to the Medical Department with superficial burns. By this time the entire plant was being evacuated.

The most important equipment for emergency care of injuries was moved out of doors. In a few minutes the smoke became so dense that we were forced to move three times. By 4:30 P.M. our mobile first aid station had settled in a neighborhood backyard. Casualties, thus far, had consisted of minor burns and lacerations. Some of these were sent to Redford Receiving Hospital and others to the Wayne County General Hospital. About this time we detached one of our nurses to set up a first aid station at the west gate of the plant.

At 4:45 P.M. I moved to the south and west sides of the plant where many of the people on the second floor of the office building had been trapped by the sudden rush of heat and smoke from the plant. Many escaped through windows and came down ladders. Several had been sent to the hospital due to smoke, shock and lacerations.

By this time, the Red Cross, the Salvation Army and other disaster agencies had moved into the plant grounds and were serving coffee, sandwiches, providing transportation, etc. Our own mobile first aid station had moved across the highway to a partially finished bank building. Water and electricity had been brought in.

There was a miraculously small number of casualties. A number of firemen had been overcome by smoke and had received oxygen and artificial respiration. Most of these were revived quickly and some went back to the job. By morning we were able to move our field first aid station back to the experimental garage. Except for the office area, the power house, and Medical Department, the plant was a twisted wreck.

In our day-to-day work we stress initiative and encourage creative thinking. As a result, during the fire everyone did a top job, taking responsibility wherever something

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needed doing. For several years, we have had classes in first aid for Plant Protection Department and supervisors. This training paid off. During the fire many of the minor casualties were cared for before they were seen by medical personnel.

CASUALTIES

Fortunately, all of the burned cases were relatively minor, the result of being splattered by hot oil and tar. We removed the offending material immediately and applied a sterile vaseline or furacin dressing.

There were a number of minor lacerations mostly due to broken glass. We did not attempt any suturing, but sent such cases to outside hospitals. None were severe enough to require hospitalization. Several people had been partially overcome by smoke, heat, etc., and were taken to Receiving Hospital or the County Hospital. A few of these were kept overnight but recovered within a few days.

One man sustained severe damage from heat and smoke. He was an executive who courageously stayed behind in the office building to make a final check. He was trapped by a sudden onrush of smoke and heat, became semiconscious and was rescued in the very nick of time. He was hospitalized for two weeks. He sustained burns of the cornea of both eyes which healed without risiduals. For several days the patient coughed up what were probably casts of his bronchioles, grayish in color and streaked with black. X-rays showed an extensive broncho-pulmonary infiltration of both lungs. He had a daily temperature elevation to 101° for one week. This gradually descended to normal. The sputum decreased in density and by the 15th day was clear. Treatment consisted of antibiotics, steam inhalations, and postural drainage. The patient improved rapidly and was able to return to work the second week of September. Chest x-rays showed progressive clearing over the next several months.

In the spring of 1954 the patient had a recurrence of his cough plus fatigueability and some muscular soreness. He was given a course of antibiotics and sulfa drug during which time he remained home. In a few weeks the cough disappeared, and he was essentially well. Once more, in August, he developed fatigueability and mild cough. A short leave of absence was granted during which he received another "antibiotic blitz." Since that time he has felt well.

There were three fatalities and all occurred in the Ternstedt Instrument Division area of the plant. This was probably because this area was divided into a number of smaller rooms so that it was easier for people to be lost as soon as the lights went out. In addition, the fire originated to the west of the Ternstedt Division and was blown by a strong west wind into the Ternstedt area. Dense clouds of smoke made it impossible to see. All three casualties were men who apparently had become lost and were killed by asphyxia and heat.

TRANSPORTATION AND COMMUNICATION

Within minutes of the start of the fire ambulances were at the scene. These had been alerted through the Civil Defense system. Numerous Civil Defense organizations such as the Red Cross, the Civil Air Patrol, the Salvation Army, the Boy Scouts and others, provided adequate transportation for all needs. After the first 20 minutes or so, we were entirely dependent for communication upon messengers. The Bell Telephone System can quickly supply field telephones in any emergency. Also the Red Cross can

often supply them. Since the fire our Plant Protection Department has acquired a short wave broadcasting system including "Walkie-Talkie" units which would be of great value in an emergency.

SUMMARY

(1) In probably the greatest industrial fire in history, the number of casualties was remarkably small. However, if the number had been greater we still could have handled them. We had numerous offers of assistance from several industrial physicians in neighboring plants.

The principal reason for the small number of casualties was that every supervisor in the plant took immediate appropriate action and kept his head. Each of the supervisors immediately saw that his employees were safely out of the plant. There was no panic. Thus, the evacuation of the plant was accomplished in an orderly manner and in spite of the rapid spread of the fire.

(2) Transportation and communication: Adequate transportation was provided by the disaster agencies. Communication was dependent for the most part upon messengers.

(3) The Civil Defense organizations took action within minutes of the start of the fire and did a splendid job of providing transportation for the injured, helping in communications, traffic control and many other functions—providing plenty of coffee, sandwiches, etc., for the hundreds of people working at the scene of the disaster. We owe all these organizations a great debt of gratitude!

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PILOT AGING: A MODERN MEDICAL CHALLENGE

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The purpose of this paper is not to present results of research or clinical studies, but to bring into attention a problem that is rapidly growing in magnitude. It is the usual impression that flying is predominantly an activity for the youthful. Partially, this is the result of the aura of adventure with which flying has been cloaked since man first looked with envy at the birds, but, mostly, it is the summation of the rapid progress of events during this fifty year period since the first successful human flight and of our unwillingness to admit that we are growing old. Most of us can remember our first airplane. All of us can remember our first flight. However, a little honest calculation will verify the fact that, since the air transport industry is well past twenty-five years of age, the young men of twenty, who pioneered commercial aviation, are today at least 45 years of age, and many have passed their fiftieth birthday. McFarland[1] reports (Table I) that, in 1950, of the 8,255 airline pilots, 1.673 were over 40 years of age, 531 over 45 and 175 over 50. In October of this year the Civil Aeronautics Authority[2] had 1,026 valid, commercial licenses issued to persons 60 years of age or older (Table II). This number is increasing so that by 1960 there will be over 5,000 such active licenses. One hundred and eighty-eight of these will be active, airline pilots, 1,212 will be second class or commercially licensed persons, and 3,606 will be private pilots. This last group will largely utilize their private physician for their examination. Hence, the practicing physician will be faced with the determination of the fitness of this group to fly.

TABLE I

AGE DISTRIBUTION OF AIRLINE PILOTS**

Age Group	Number	Cumulative Totals	
40-44	1,142	1,673	40 and over
45-49	356	531	45 and over
50 and over	175	175	50 and over
Total	8,255		

An analysis of these figures makes it clear that the first challenge of the aging pilot is closely related to the entire problem of aging. It is unfortunate that Lansing has to state in his Preface to the Third Edition of Cowdry's Problems of Aging[3], that a spirit of pessimism is present in many of the chapters of this book and it is discouraging when he says "Research on the biology of aging is almost at a standstill."

It is still more unfortunate that the process of aging is even more significant for fliers than for the general population. The pilots have an economic drive to maintain, for a normal life span, their efficiency and earning capacity, and their employers have a significant financial investment in the training and experience which these airmen accumulate. It is significant that only about 13% of commercial pilots are still active after 40 years of age. The remainder have been lost to aviation or have lost aviation as their means of livlihood. This represents the loss of a large capital investment.

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**Modified from McFarland, R.A., 1952

McFarland[1] summarized the biological studies which have been reported on the aging pilot group. The many studies reviewed indicate that this older group of pilots showed no loss in productivity, no accident proneness, a decrease in sickness rates and no effect of aging on their ability to maintain their homeostasis in adjusting to their environment, except in circumstances of severe stress. Parenthetically, this exception may be significant for commercial aviation and is definitely significant in military operations.

The older pilot group reveals a lengthening of reaction times and shows definite changes in such functions as their ability to learn, memory, reasoning and judgment. Compensation takes place, however, for many of these changes, so that deviation does not necessarily indicate deterioration. Actually, flying experience seems to more than make up for these changes with age.

A report[4] from the USAF School of Aviation Medicine provides the information that military aircrewmen, who show adverse signs of aging, have frank symptoms of physical and physiological deterioration, changes in motivation and the ability to learn new skills or to improve others and a lowered performance level at their regular jobs. In addition, they have lowered interpersonal relationships and a tendency to a generally lowered morale.

The most significant changes with age are the loss of sensitivity of the sense organs, particularly in vision. Accommodation, acuity, depth perception and dark adaptation are functions which do deteriorate adversely with advancing age. Obviously, these are functions important to flying operations.

The Air Force pilot is getting older in a manner somewhat analagous to the commercial pilot. In 1947 their average age was about 27. Today, it is close to 35 years. Hence, the problem of the aging pilot in the military services is qualitatively quite similar to that of the aging pilot in commercial and private flying. Unfortunately, the problem is quantitatively more intense in the military situation because of the added stresses of combat and because of the longer, higher and more rapid missions undertaken.

A breakdown of the Air Force population (Figure 1) shows that the officer group's average age is 35 years, while the airmen's average age is between 21 and 22 years of age. A study of the underlying causes of physical disability reveals that each group is subject to an impairment distribution in keeping with that of similar groups from the civilian population. The exceptions to this seem to be a slightly higher than expected incidence of arteriosclerotic heart disease, arthritis and digestive diseases. This serves to emphasize the relationship of the so-called degenerative diseases and aging.

Inasmuch as personal management underlies most Air Force medical problems, rather than simply an understanding of the natural history of disease, the real problem confronting the medical department is not that men grow old. This must be accepted. What actually must be determined are the effects of aging on aircrew performance so that individual fitness can be determined and the deleterious effects of aging avoided.

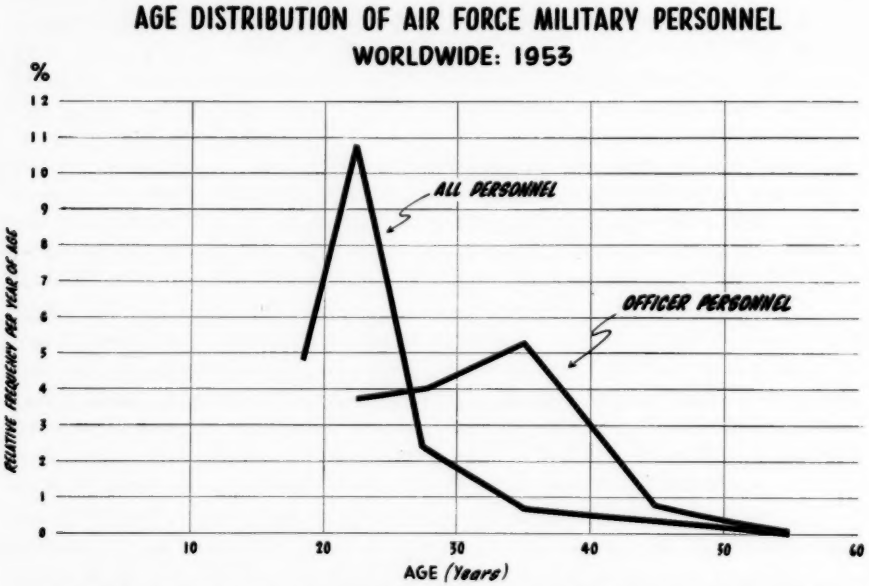
Facetiously, it might be said that the Air Force follows that school of biology which teaches that a cell or body begins to die as soon as it is created or born. It can certainly be stated, factually, that many military directives and orders imply that certain categories of old age have been reached while men are still in their twenties, e.g., 28 years is regarded as a maximum for transition to jet fighter training. Yet such rules

seem to ignore the often proved fact that few aspects of human biology reach their apex before age 20 or 21 and some reach their maximum much later, even after fifty years of life.

In all flying, but particularly in military flying, a nice balance must constantly be reached between youth and experience. It is good for a pilot to be youthful, untroubled and untrampled by responsibility and full of dash and daring. It is mandatory that he have experienced judgment so that he will avoid rash, unconsidered actions.

Much has already been written about the psychology, physiology and medical aspects of aging. The continued need for knowledge emphasizes three areas for study. First, aging is not restricted to man and animals but occurs in all forms of life and in some inorganic forms, such as crystallization of metals. Second, growth in its entirety must be studied, for no certain chronological, cellular age represents senescence. Third, aging is not only a biological problem, in the sense of altered physical and chemical states, but aging is also a sociologic and psychologic problem.

Much is already known as to the methods of diagnosing and, it is to be hoped, of predicting advancing age in the laboratory studies of lipoprotein fractions, cholesterol levels and other aspects of atherosclerosis, currently so popular. However, the actual practical utilization of such research is still in the future.



In addition to such obvious sources of research data in physiology and psychology, many other sources may provide research to aid in the solution of this growing, medical problem. Typical of such sources are experiments which deal with the life span of the exotic little rotifer[5]. The findings reported indicate that maternal age directly influences the longevity of the rotifer. This has a counterpart in the well-known fact that early born children have a tendency to live longer than those born to parents of advanced age.

Sociological studies, likewise, may prove helpful. Modern society has forced man to abdicate being complete master of his own destiny. Society places increasing amounts of responsibility on youth until, ultimately, they cannot carry that burden if they are to meet their normal biological responsibilities, such as being parents. Likewise, this shift of responsibility overtakes the labor pool of youth, while producing economic disaster for those of advancing age and causing the loss of self-respect of the elderly. Much is lost to society when it fails to utilize the talents and abilities of everyone, literally from the cradle to the grave. Although it is easier to apply chronological age rather than measure physiological and psychological manifestation of aging, and, although chronological age barriers are deeply established in cultural tradition, this is a stifling concept that must be overthrown.

These are only hints at the possibilities of biological, physiological, sociological and psychological areas of research and of the pressing need for such studies. The growing problem of pilot aging only intensifies the need for research in all the problems of aging. The problem of the older pilot will increasingly be brought to the attention of the private practitioners of medicine and surgery.

TABLE 2—CIVILIAN PILOTS ABOVE 60 YEARS OF AGE*

	1954	1955**	1960**
Airline Pilots	35	53	188
Commercial Pilots	257	344	1,212
Private Pilots	1,145	1,412	3,606
Total	1,437	1,809	5,006

*Chart prepared from CAA data supplied by W. R. Stovall
**Projected figures based on current trends.

REFERENCES

1. McFarland, R. A.: Human factors in air transportation, New York, McGraw-Hill, 1953.
2. Stoval, W. R.: Personal communication.
3. Lansing, A. I.: Cowdry's problems of ageing, ed. 3, Baltimore, Williams and Wilkins Co., 1952.
4. Dennis, W.: Age and behavior; survey of the literature, USAF School of Aviation Medicine, Project No. 21-0202-005, Report No. 1, May 1953.
5. (a) Lansing, A. I.: Transmissible, cumulative and reversible factor in ageing, J. Gerontol. 2:228, 1947. (b) Lansing, A. I.: Evidence for ageing as consequence of growth cessation, Proc. Nat. Acad. Sci. 34:304, 1948.

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ETIOLOGY OF MENTAL HEALTH

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Thirty years ago, when I first started post-graduate studies at the Henry Ford Hospital, it was not difficult to diagnose mental illness. It was simple, because at that time it was naively felt that the mentally ill fell into one or the other of two categories of psychopathy. These psychopathies were insanity in either sex and/or hysteria in women. Even then the caprices of the hysterical woman were viewed with skepticism. Most doctors doubted that she was sick at all. The hysterical woman was dubbed a prima donna, putting on an act, or she was accused of willfully forcing others to feel sorry for her. The medicos, reduced to helplessness by the hysteric's calloused disregard for their best therapeutic ventures, were furious with her. Accordingly, as if she were a spoiled child in need of punishment, they dumped her into the lap of a psychiatrist, crying out in desperation:

"Another hysterical woman!"

The psychiatrists were bogeymen, waggled in the face of the hysteric, to force her into a state of therapeutic compliance.

But that was in the old days, when no one seemed to recognize that the so-called hysterical woman was performing in a fashion more human than was the man who, under identical pressures, grimly clenched his teeth, repressed his chagrin, and went stoically about the job of preserving the myth of masculine superiority. Men will be men! But, by being men, they blow out their coronaries, eat holes in their gastric mucosa, and burst their cerebral vessels. They die five years sooner than women, sacrificial victims to the god of masculine power.

Not so long ago there were seventeen peptic ulcers in men for every peptic ulcer discovered in a woman. Coronary thrombosis was a man's disease. And for that matter, among the psychopathies, crimes of violence—murder, or attempted murder—at one time paralleled the male-female statistics for peptic ulcer. However, since men have so effectively sold women on the fallacious proposition of the superiority of men there is one female murderess for every eight male murderers.

It is not to be deduced from these statistics that men are becoming more docile. Quite the contrary! Women are shedding their softer side to become more masculine. In this modern age they commit male crimes and they suffer male diseases.

The male way of life, a way forced upon him culturally by the traditions and covenants of occidental society, directs man to swallow his feelings. His type of psychic illness is spawned by this enforced alimentation of the indigestible elements of his milieu. Forced to swallow his chagrin, the anger derived from his frustrations is anchored in his tissue as well as in his psyche. Man is more responsible than woman for the birth of a new science—the science of psychosomatic medicine.

The difficulties attendent upon making a diagnosis of mental illness is increased in direct proportion to the possession of knowledgeable concepts of those diseases which anchor fear-rage in the tissues of the body. It is no longer cozy to make a sharp distinction between what is psychopathic and what is not psychopathic.

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However, strange to say, modern psychiatry understands mental illness better than it understands mental health. Few authorities agree on the meaning of mental health. Some scholars, out of reverence for the traditions of Freud, naively contend that it means the wholesale conversion of the "constitutional ferocities of mankind" into socially acceptable activities. According to this Freudian definition, a healthy man "successfully" harnesses his "inherited rages" and "undesirable instinctal cravings." He sublimates himself. In other words, he somatizes his truculence.

Another set of social scientists, weighed down by ponderous statistical devices and inflexible systems of classification and methods of operating, arrive at their own specialized conclusions regarding character-structure. In so doing, they accept the most frequently occurring character-type as normal for the aggregate of human beings under study. These sociologists, using the statistical approach, would describe cannibalism as being normal—normal for the Mundugumor of New Guinea, for instance. To my mind, cannibalism is never normal, and even for the Mundugumor all we can say is that it is a statistically significant characteristic. There are myriads of similar instances of the statistical normal being used to replace what is considered, from a dynamic point of view, the actual normal. The branch of social scientists using this statistical device fractionate culture, rather than reveal its dynamics.

From the dynamic viewpoint, mental health can be described as adequacy in thinking and feeling at each stage of development. In its final development, mental health is an expression of the mature, adult mind which possesses adequate capacity for body mastery, appropriate memory of experiences, and a capacity for prompt and meaningful memory recall and intellectual activity. The mature adult in good mental health enjoys acuity in all the five senses, and is immediately ready with appropriate responses; he competently evaluates and relates himself to living and non-living objects, and accurately measures time and space.

But there are other confusions that add to the difficulties of arriving at comprehensive knowledge of mental health. Cliques have sprung up in psychiatry, the members of which advance the proposition that adaptation to the respective societal system constitutes normality.

But the societal system is not the same the world over. Without going into the essence of this implication, it might be said that what is psychologically good for the Canadian may be psychologically bad for the Cuban. What is good for the Japanese is unwholesome for the American. The wide variety of cultural "sets" provides a wide variety of obstacles to the establishment of psychiatry as an exact science. The ramifications of these complexities penetrate every department of human experience, since psychiatry deals with theory and practice, politics, espionage, sabotage, disciplines, penal systems, propaganda, ethics, crime, wars, plagues, economics, religion, industry, sociology and every other kind of "ology;" history past, present and future; mental health and mental ill health. In fact, psychiatry embraces the totality of living as experienced by human beings in every part of the globe.

This could be stated another way:

In America a man is "normal" if he conforms to the American way of life. In Russia a man is "normal" if he conforms to the Russian way of life. In Japan a man is "normal" if he conforms to the Japanese way of life. But these conformities to the

"ways of life" are emotional adaptations. At birth the American, the Russian, and the Japanese do not differ emotionally. Emotional differences are precipitated in the human individual by the pressures of his environment. The American social structure produces the American character type. The Russian social structure produces the Russian character type. The Japanese social structure produces the Japanese character type.

There are not only culturally induced differences in the psychology of individuals, but there are also culturally induced differences in psychiatry. Psychoanalysts have been preoccupied with this self-same problem.

Adequate adaptation to the cultural institutions and mores is often advanced by psychoanalysts as an evidence of psychoanalytic cure of a psychopathy. This would mean then that psychoanalytic cure in Afghanistan would be different from a psychoanalytic cure in Russia. A psychoanalytic cure of a Mundugumor in New Guinea would produce a different personality structure than that produced by the psychoanalytic cure of a Balinese, on the island of Bali. The cure of an Englishman in England would be different from the cure of a Japanese in Japan. In each of these instances the standard of measurement for cure is cultural adaptation. It would seem that such psychoanalysts virtually equate cultural adaptation with maturity. In other words, according to such authorities a person is mature when he adjusts to his native culture. I think this an error.

Sociologists often err in the same manner as do many psychoanalysts. Sociologists, for example, contend that the institutional format of England is normal for the English- a similar position regarding the Japanese method of rearing children. They support the the rigid societal system of the Japanese is normal for the Japanese. They even go so far as to say that English child-raising techniques are normal for English children because these techniques fit the child for the English way of life. These same sociologists assume a similar position regarding the Japanese method of rearing children. They support the method because they contend that the Japanese method of child rearing fits the Japanese child for the Japanese way of life.

To shed more light on the subject of culture-personality, I will excerpt a quotation from the work of the noted anthropologist, A. Irving Hallowell[2]:

"When we have more knowledge of the range and variation in the human personality structure in relation to major provincial determinants we shall be able to state with more precision what is common to many everywhere. By that time we may be able to construct a better picture of the psychobiological structure of man as an evolving primate . . .

"Man's world became one that was not simply given. It was constantly moulded by his interaction with it. Through the manner in which he represented it to himself it further became meaningful to him. But once a particular cultural system became established, a mode of life to which future generations had to adjust became perpetuated. The individual was forced to make his personal adjustment to live by means of the symbolic system provided by his society."

Douglas Haring[3] put it this way:

"An underlying hypothesis of the recent anthropological-psychoanalytic studies, *sans* technical jargon, may be summarized briefly. With due allowance for physical and

regional limitations and for cultural history, the unique aspects of any society are determined and maintained by emotional habits learned in infancy by a majority of the participating individuals. Much of this learning occurs before the infant learns to talk. Consequently, a variety of socially-important emotional habits continues vague and indefinite, even unconscious, throughout every individual's lifetime. One knows only that certain types of social situations are congenial and he feels at home in them, while in other situations he is ill at ease, even violently disturbed. The experiences of early infancy, reinforced by subsequent events have developed in him unconscious criteria of social and cultural choice. Such preferences one takes for granted, despite fluent rationalizations, the ultimate criteria of his personal and social preferences lie beyond his ability to perceive objectively and to describe verbally."

These quotations could be supplemented by many, many other quotations similarly couched. They are representative of the trend in the thinking of a host of sociologists, anthropologists, psychiatrists, economists, and educators.

A social scientist, if sufficiently mature, maintains an unbiased attitude toward social scientists from other cultures. A mature mind is enriched by the different qualities of humaneness that occur in people from other parts of the world. In fact, it is conceivable that if all the earth's personnel achieved maximum maturity there would be no variation in cultural configurations. Social differences and racial prejudices would cease their side-by-side existence. Unfortunately this solution to our problem will be a long time in coming.

Even after recognizing the significance of syncretic conformity to cultures in this occidental society, we regularly encounter in adults infantile components that are disturbingly inoperable and are well nigh ineradicable. More penetrating studies of the childhood of the adult are indicated to clarify the multiple reasons for the built-in infantilisms so often demonstrable in the cultural pattern of the American occidental.

In my investigation of the origins of perpetuated infantilisms I might add that the child that controls, bosses, influences, startles, or wangles the important people in his life does so because he is afraid of them. His emotional disturbance may not be a neurotic accent. His bossy tantrums are his way of defending himself against fears. The fears that demonstrate abnormal insecurity in the child are, for the most part, connected with real unwholesome or series of real unwholesome occurrences that stemmed from his mother's injudicious, smothering neglect, or alternating smothering and neglecting care of him. Because his mother mismanaged him, he distrusts her. Because the mother deceived him, he no longer believes in her. Because he loses confidence in his own mother, he loses confidence in himself and in everyone else.

This child during a critical infantile period in his life felt that his mother had abandoned him, or he felt that she had scheduled him, bossed him, smothered him or hurt him. He felt that she had robbed him of his prerogatives. She denied him his birthright. She stifled his curiosity, prevented his development, and disrupted his rhythms.

This beggared his understanding. Finally his mother's unsympathetic attitude meant to him that she did not love him. He argues: "Mother does not love me. She uses me. She resents me. She lies to me. She smothers me. She deserts me. She takes away my

privileges. She does not like my way of growing up. She wants me to grow up her way. She is not safe. I cannot rely on her." And this does not exhaust the list of complaints against the mother.

Actual experience has dramatically taught us that if the child goes unloved for too long a time during some phases in his life cycle, he arrives at a most devastating conclusion. He concludes that he is unloved because he is unlovable.

Our culture is artificially rigged to support this catastrophic conclusion. Despite the mother's culturally induced deceit and culture-bound inadequacies, gaudy and giddy campaigns, if not commercially incited at least commercially exploited, are forever being launched to sanctify, to epitomize, to deify, to concretize, to immortalize the symbolic role of mother. In this day and age these campaigns are a *must*. They must bolster the modern mother's preposterous pretensions. And these silly pretensions are reinforced by such slogans as: "Mother knows best." "A child should be seen and not heard." "Spare the rod and spoil the child." "Cleanliness is next to godliness." Such disciplinary attitudes are most inimical to the materialization of the child's sense of self-respect.

The unloved child who feels unloved because he is "unlovable" is stalked by a pervading sense of insecurity. This suspense is intolerable. In pursuit of relief he adopts methods of behaving that ignore the heart, that ignore love. To be precise, he vacates the field of love for the field of power. He puts his faith in the will to power as a means of providing security for himself. This decision of power at any price, compounds his insecurity and casts him into a maelstrom of the most vicious of vicious circles. He finds himself inspired, then haunted by a new ghost. To survive, it is necessary for him not only to be powerful, but to be ALL POWERFUL. He must get his own way at all costs.

In our culture, these so-called recalcitrants do not constitute the exception to the rule. Disturbed children are the rule. If the culture gets in its best "licks", these balky colts are forced to conform. If the disciplinary measures of the culture are ineffectual, these balk colts become balky men. If but mildly balky, they are dubbed eccentric. If radically balky, they are called criminal psychopaths, or they are classified insane. Between these two cadres are many nuances of social maladjustment. But those that conform to society by an initial harnessing of their recalcitrant infantilism may break down at a later date, may break down at any time a social or an economic straw breaks the camel's back. Those that rigidly and consistently conform to society wind up with psychosomatic diseases.

Regardless of the culture into which the individual is born—ego growth (that outgrows infantilism) is the growth of the self. Is this an unachievable ideal?

Growth of the self implies self expansion, flexibility, self-respect, creativeness, appropriate generosity, appropriate sustenance of effort, adequate industry, and withal self growth implies an effective capacity for communicating with others. In all, self growth is growth that works toward as complete a maturation as possible within the limits of the original potential endowments. An ego or self adequately developed will find it unnecessary to become abnormally dependent or to become abnormally independent. One might express this as an ideal concept, as a desideratum.

The emotionally mature person is a person who is properly contained within his own skin. He is a person who has fully developed his ego boundaries and his skin boundaries without those boundaries being blurred or partially obliterated by containing unintegrated elements of the mother image. These unintegrated maternal memory elements blur the proper memory of the ego boundaries because of some unresolved bitter precognitive experience or experiences that occur in the early "togetherness situation" with the mother. However, I am not going to discuss this aspect of maturity. Suffice it to say that if the individual possesses an uncontaminated memory and an uncontaminated picture of his own skin then he will have achieved maturity. I refer those readers who desire further enlightenment on the subject to the works of Paul Schilder[7], Paul Federn[1], Willie Hoffer[4], Clifford M. Scott[8], Karen Machover[5], Moloney[6], *et al.* This idea of measuring maturity by assaying the adequacy of body image is not too meaningful to most of the casual students of sociology and it has not achieved the popularity that it deserves.

For the purposes of this paper, however, it will be more effective to return to a descriptive review of the subject of emotional maturity. Normal emotional adultness has been described as adequacy in thinking and feeling for every stage of development. But this definition is too circumscribed. It requires further elaboration. This elaboration should include most of the cardinal prerequisites of emotional maturity. Self respect is first on this list. Self respect has been called by other names, such as integrity, self esteem, and self confidence. They all mean the same thing. Shakespeare expressed this beautifully when he made Polonius say, "To thine own self be true, and it must follow as the night follows the day that thou canst not then be false to any man." Without probing any more deeply into the matter, it is enough to say that if a man is true to himself, if he has a proper feeling of inner worth, it will not be necessary for him to destroy his fellow man. Further, because of his inner strength, he will find himself capable of helping his fellow man who is less fortunate than himself in the possession of self-esteem.

But self-respect is only one characteristic of emotional maturity. I will enumerate some other attributes without attempting to go into more detail. This enumeration is somewhat of a repetition but it is a subject that bears repetition. The emotionally mature person possesses adequate flexibility, adequate generosity, adequate creativeness, and adequate industriousness. He is neither a slave to dependency nor a slave to independency.

It is not enough to explain the meaning of ego development. It is also necessary that each element entering either directly or indirectly into the promotion of ego expansion be adequately assayed if we are to gain any understanding of the meaning of the process.

In stating our thesis with respect to the promotion of ego growth, we spoke of "properly measured mothering from a relaxed loving mother." Emmy Sylvester has highlighted the necessity for the mother to keep abreast of the infant"s needs. The infant requires unconditional maternal love from motherly mothers, but it is at no time implied that such love can be of the stifling variety. An apt descriptive phrase has come into being in this connection, the expression "smother love." The recommendation that the child should receive unconditional mothering during the first two years of its life

has, in some quarters, given rise to some opposition. Such opposition has occurred and is still occurring in those quarters in which there has been some misunderstanding of the meaning of unconditional love during the first two years of life. This misunderstanding is largely due to the fact that few people in our culture are free of unconscious bias toward natural child rearing. They are rendered insensitive because of their own unresolved emotional attitudes toward the subject. For example, it is still asserted by some that mothers must have their freedom even if it means the sacrifice of the child's emotional health. It is also frequently asserted that the child needs to experience responsibility and frustration if it is to undergo proper development. It is therefore recommended that frustration commence early, while the infant is still in the crib. Unconditional love is regarded with both alarm and distaste as encouraging the child to grow into the ways of licentiousness and indiscipline. It is argued, if his bestial original sins are not curbed, he will grow into a problem, troubled and troubling, and unfit for association with his fellow man.

However, to refute this error it is enough to say that it is now understood that the child is not born with destructive drives. The destructive tendencies develop subsequently as reactions to frustrations put upon him by the significant persons who conditioned him. Furthermore, it is also known that the lack of proper maternal love in the first two years of the child's life may cripple and distort his psychological development. It is necessary to know such facts about emotional development before one can understand the meaning of Sylvester's advice concerning mothering.

Perhaps this point could be illuminated by citing, as an example, the child's first efforts to obtain a drink of water. The glass sits on the tray before him. It is three-quarters full of water. He reached out clumsily in his attempts to grasp the glass. He is awkward and his attempt is misdirected. A mother versed in the child's needs will allow him to toil with the glass until he looks in her direction and signals that he needs her help. Rushing prematurely to the child's assistance, merely because she cannot stand to have water or milk splashed on her rug or because she cannot stand disorder, is unfortunate insofar as the child's ego development is concerned. If the mother cannot tolerate the free, expansive, unpredictable movements of her child, then she is not affording her baby the proper quality of mother love. This mother smothers her child. She interferes with the child's rhythms, with the child's internal penchant for expansiveness-for-growth. This seeming over-indulgence is not an act of kindness nor an evidence of understanding the child's needs. Let it be said at once that every child, as part of his method of acquiring knowledge, must feel free to expand and to investigate. He must satisfy his curiosity whenever it is safe for him to do so.

It will not be inappropriate to point out that mothers sometimes err in still another way. For example, they may neglect to assist the child in his attempts to manipulate the glass of water after he has become exhausted by his own efforts. If the child looks to the mother for help, especially after he has made a heroic struggle to help himself, the mother should without delay come to his aid.

Hence, the proper measure of maternal love means neither too much nor too little loving support for the child at any stage of his development, but the proper disbursement of it in relation to the child's needs.

There is a point to this whole discussion of emotional maturity. If a human being does not achieve emotional maturity, he is frustrated. If he is frustrated, he is frightened and enraged. Sometimes the rage is concealed beneath his placid facade, but it is there nevertheless, and it is searching for a target. That target might be any innocent bystander. A nation of individuals of similar immaturity might well unloosen their massed angers upon another nation as a target for their angers. The existence of such a pool of angers underwrites war.

* * * *

In the construction of this paper, excerpts from the following were used:

The Battle for Mental Health. (New York: The Philosophical Library, 1952.)

Brochure on *Understanding the Japanese Mind.* (New York: The Philosophical Library, 1953.)

Unpublished paper entitled *Fear: Contagion and Conquest.*

A subcommittee report to the International Committee for the American Psychiatric Association on "Corresponding Membership in the American Psychiatric Association."

"The Will to Power and the Use of Deodorants." Paper read before the Central Neuro-Psychiatric Association in Detroit, Michigan, on October 8, 1954.

BIBLIOGRAPHY

1. Federn, P.: Ego psychology and the psychoses, New York, Basic Books, Inc., 1952.

2. Hallowell, A. I.: Personality structure and the evolution of man, Am. Anthropologist 52:172, 1950.

3. Haring, D. G.: Aspects of personal character in Japan, Far Eastern Quart. 6:14, 1946.

4. Hoffer, W.: Development of the body ego, Psychoanalytic Study of the Child 5:18, 1950.

5. Machover, K.: Personality projection, Springfield, Ill., C. C. Thomas, 1950.

6. Moloney, J. C.: How to cherish the infant and free the mother, Ment. Hyg. Bull. 8(#2)10, 1950.

7. Schilder, P.: The image and appearance of the human body, London, Kegan Paul, Trench, Trubner & Co., Ltd., 1935.

8. Scott, C. J.: Some embryological, neurological, psychiatric and psychoanalytical implications of the body scheme, Internat. J. Psycho-Analysis 19:1938.

9. Sylvester, E.: Pathogenic influences of maternal attitudes in the neonatal period, Trans. First Conf. on Problems of Early Infancy, New York, Josiah Macy, Jr. Found., 1947, p. 67.

Birmingham, Michigan

CANCER DETECTION

HARRY M. NELSON, M.D.*

Until the etiology of cancer has been discovered and a specific agent manifested for its cure, the best method of controlling this disease continues to be recognition and treatment of the malignancy in its earliest form. In many instances it is possible to recognize and eradicate lesions which, while not yet malignant, possess definite malignant potentialities. Our objective in controlling cancer today must be the maximal utilization of methods of prevention, detection, diagnosis and treatment already at hand.

Early recognition of cancer can be accomplished in several ways. The first, the ideal of any cancer detection program, is for every doctor's office to be a cancer detection center. Such a plan will ultimately be necessary to meet the requirements of a full scale, cancer detection program and save the 50% of cancer victims now possible. However, it has the disadvantages of being a relatively limited type of examination, being done by doctors of varying interest and with varying thoroughness, and statistical data accumulated by such a system is difficult to evaluate. The opposite of this, of course, are central cancer detection centers associated with the various medical schools and some clinics. In these centers, examinations can be more complete, done by experienced personnel, and the results, already centralized, make statistical evaluation a relatively simple problem.

The Yates Memorial Clinic, representing one of the latter type of clinics, was established in 1950 by the Southeastern Division of the American Cancer Society and is operated professionally by the Wayne University College of Medicine, with the approval of the local medical society. Patients come to the clinic through the stimulus of information gained from the radio, magazines, newspapers or are referred by private physicians. Before being examined, the patients must state the name of the private physician to whom the report is to be sent. A complete history is taken and physical examination is performed, including in the female a pelvic inspection with routine Papanicolaou smears of the cervix and vagina. Sigmoidoscopic examinations are done regardless of sex or age. Complete blood counts and urinalyses are performed routinely, and biopsies are taken when indicated. Ear, nose and throat examinations, with visualization of the vocal cords, are made, and roentgenograms of the chest are obtained when symptoms warrant. The diagnoses and recommended treatment are not discussed with the patient; rather they are instructed to consult their private physicians. This examination is free, although voluntary contributions are encouraged.

The basic aims of the Yates Memorial Clinic, as postulated when the clinic was initiated in May, 1950, are: (1) to operate a small model teaching clinic, (2) to provide facilities for the early diagnosis of cancer, including the evaluation of various diagnostic tests and (3) to gather statistical data on the prevalence and incidence of cancer in the community. With these goals in mind, I should like to point out some of the accomplishments of the clinic. The coding, tabulation and analysis of the records, as well as the maintenance of follow-up of persons examined, is being done by the

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CHART I

Yates Memorial Clinic

NUMBER OF PATIENTS EXAMINED

May, 1950 – Dec., 1953

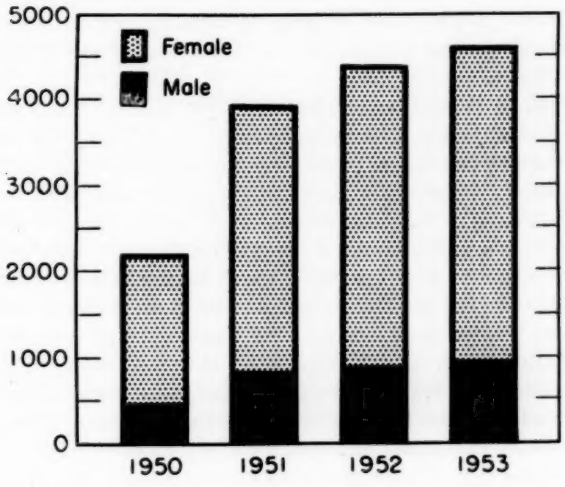
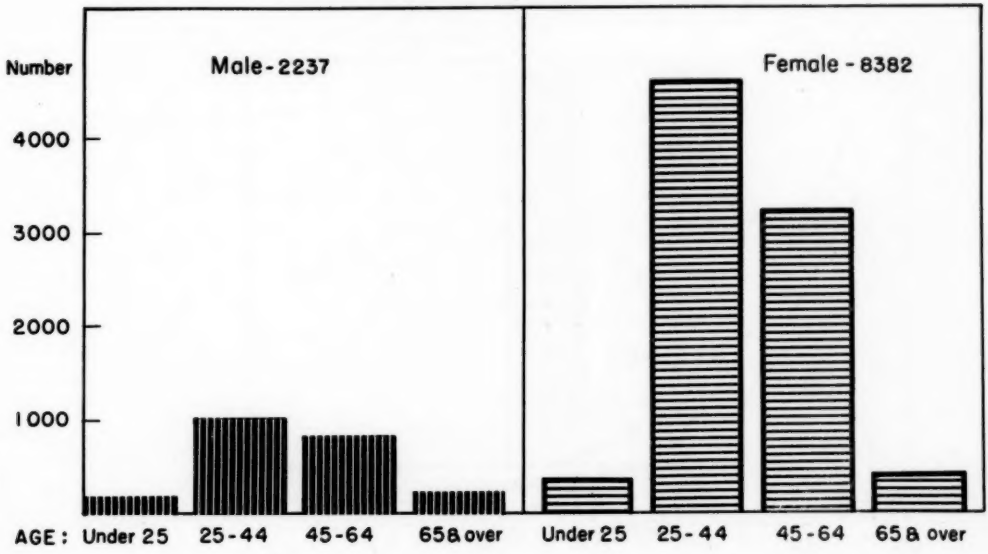


CHART II

CANCER DETECTION EXAMINATIONS BY AGE AND SEX

Yates Memorial Clinic, May 1950 - December 1952



section of statistical research of the American Cancer Society. Various analyses of the data will continue. From May, 1950 through December, 1953, 15,266 patients (Chart I) have been examined at the Yates Clinic, with the yearly breakdown as shown in this graph. During 1950 we examined 2,238 patients and the number has steadily increased until in 1953 we examined 4,639 individuals. In most cancer detection centers, there is a decided preponderance of women. In our series approximately 80% were women. The female majority can probably be explained on the basis of the greater prospect of detectable lesions in a curable stage in women and their ability as housewives to visit the daytime clinic.

In Chart III is shown the distribution of the patients examined at the Yates Memorial Clinic from May, 1950 through December, 1952, by age and sex. It again demonstrates the preponderance of females and also shows the tendency toward a young age group. Over half of all patients examined were under 45 years of age. We hope, in the future, to ask those over 45 to return for yearly examinations.

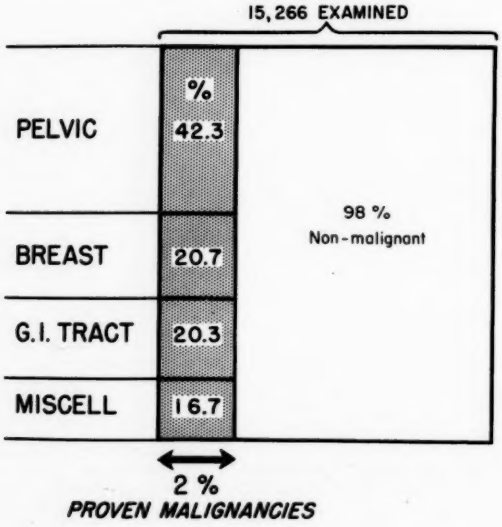
In Chart III is shown the incidence of proved malignancy and a general analysis of distribution by site. Pelvic malignancies constitute the largest group of detectable cancers, 42.3%, followed by breast, 20.7%, the gastrointestinal tract, 20.3% and finally, the miscellaneous group, 16.7%. The relatively high, overall rate of proved malignancy in this clinic, 2%, as compared to other series, is partly explained by the fact that not all our examinations can be classified as true, well-person, "detection examinations. Cancer "detection" implies the examination of an asymptomatic and, presumably, healthy individual. The prevalence of cancer found often reflects the thoroughness with which symptomatic cases are weeded out and refused examination. Although the Yates Clinic primarily serves the asymptomatic patient, only those with

CHART III

Yates Memorial Clinic

SITE and INCIDENCE of PROVEN MALIGNANCY

May 15, 1950 - Dec. 31, 1953



complaints obviously related to cancer are denied examination. The second reason for the high rate of malignancy in this clinic is the emphasis placed on vaginal and cervical smears and the generous use of biopsies. Of the 15,266 patients examined, 1,410, or 9.2%, have had a biopsy of some suspicious area.

The number of malignancies diagnosed per 1,000 examinations by age and sex is shown in Chart IV. As might be expected, the incidence of malignancy increases with age. In patients over 70 years of age, more than *70* of every *1,000* examined are found to harbor a malignancy.

In addition to the proved malignancies, 9% of all patients examined are suspected of having cancer, or cancer cannot be ruled out, and these patients are referred back to their family physician for further diagnostic evaluation. An endeavor is being made at the present time to follow all patients with suspected or known malignancy through contact with their private physician or by return examination.

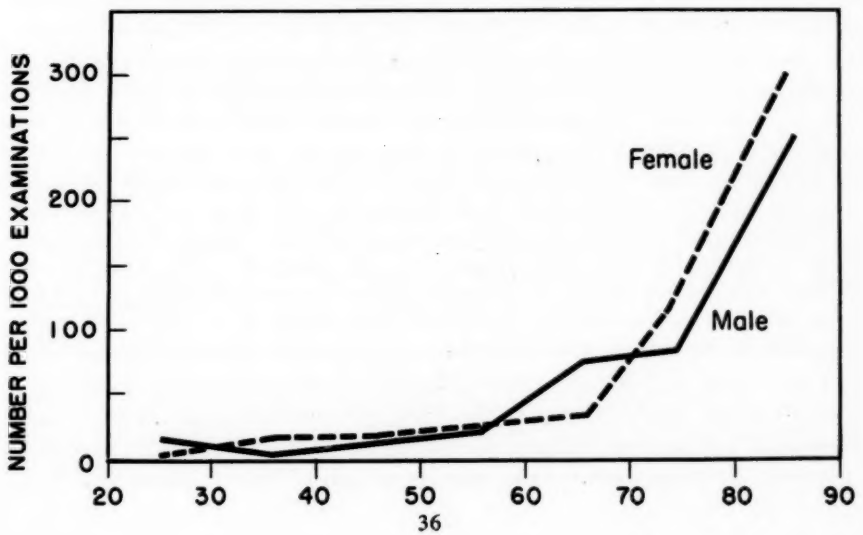
When complete and thorough examinations are made, many non-neoplastic diseases are discovered. These conditions are also reported to the patient's physician. Of interest is the fact that over 85% of patients entering the Yates Clinic are discovered to have one or more diseases, many of which have already been diagnosed by their family physician.

The clinic has carefully studied vaginal smears as a screening method to detect early cancer of the uterus. We have found that the wooden spatula has been the most satisfactory in obtaining cervical-vaginal smears. This simple, cheap device can be purchased or made from an ordinary tongue blade. We have felt that the material obtained from the cervical scraping is more diagnostic than the vaginal fluid because the cells are less macerated and deteriorated. The fixative solution and the staining method are those recommended by Papanicolaou.[1]

CHART IV

NUMBER OF CANCER DIAGNOSES BY AGE AND SEX

Yates Memorial Clinic, May 1950 - December 1952



Several ways of reporting smears are being used in this country. The classification employed at the Yates Clinic is that proposed by Graham[2] consisting of: negative, atypical, suspicious and positive. The first and last classes need no clarification. An atypical smear is one in which some cells, although not normal, are characterized by abnormalities of insufficient degree or kind to arouse suspicion of malignancy. A suspicious smear is one in which the cells are so abnormal as to suggest a definite possibility of malignancy.

The Papanicolaou smear is a method of screening for cancer; if positive, sufficient suspicion is aroused to obtain a biopsy. Smears are not diagnostic in themselves, and treatment should not be initiated on the basis of the smears alone. On the other hand, there are some cases where a positive smear has been followed by a negative biopsy, because the specimen was not taken from the involved area. For statistical purposes the positive smear does not definitely classify the case as malignant until a confirmatory biopsy has been obtained.

As seen in Chart V, of 12,015 women in whom cervical-vaginal smears were obtained, malignant neoplastic cells were found in 137 cases, or 1.1%. In sixteen cases, biopsies were not obtained and these are not included in the calculation of the percentages. Of the patients with positive smears, 121 were subsequently biopsied either at the Yates Clinic or elsewhere, and the diagnosis was confirmed in 109 cases, or 90.1 per cent. There were 12 cases with positive smears but with subsequent negative biopsies in the tissue examined, giving a 9.9% false positive rate. More biopsies would, we believe, yield a few more positive results.

Forty, or 35.4%, (Chart VI) of the cervical carcinomas were considered pre-invasive (carcinoma in-situ) by biopsy, but are classified as probably or possibly, rather than definitely, pre-invasive because of the impossibility at times of determining, by the tissue obtained, the true extent of the disease. Not infrequently, more complete histological examinations of such cervices will reveal areas of outright invasion. Seventy-three cases, or 64.9%, of the cervical carcinomas were considered outright invasive on biopsy.

Of even greater significance is the fact, as noted in this graph, that 52 or 46.0% of the squamous cell carcinomas of the cervix were not suspected on clinical examination to be malignant but were found to have positive Papanicolaou smears and were later proved by biopsy to be malignant. In these patients, before the smear was found to be positive, a thorough history was taken and a physical examination performed, including a pelvic examination with direct visualization of the cervix by a staff physician, at which time no evidence of neoplasm was encountered. Without the smears as a screening procedure, these lesions would have been missed at a stage most amenable to cure. In the remaining 54% the diagnosis was first suspected clinically and confirmed later by smear and biopsy. The bottle-neck in screening large numbers of women by means of the vaginal smear is in the cost, time and the few available cytologists.

We recently had the opportunity of visiting the Airborne Instrument Laboratory, Inc. at Mineola, New York. They are experimenting with the development of automatic, high-speed, cytologic measurements for application to mass screening for cancer—an automatic, electronic scanner. These scientists are able to measure nuclear fluorescence

or density, nuclear size and the diameters of normal and cancer cells. It was stated that if this scanner can be perfected, 2,000 vaginal smears can be scanned daily. The cytologist will find it necessary, then, to examine those smears that have abnormal nuclei, abnormal cell structure and unusual nuclear fluorescence. This screening, it is estimated, can be done at a few cents a smear.

An important function of the clinic is to act as a teaching center in affiliation with the Wayne University College of Medicine. A course of instruction in cancer detection, consisting of one afternoon a week for twelve weeks, is offered by the Post-Graduate School of Wayne University. Here, physicians of an intern, resident, or general practice level actually perform the various procedures employed in recognizing early cancer. Because of the large volume of patients handled by the clinic, it is possible for a student, during his course of instruction, to execute a procedure such as the sigmoidoscopic examination enough times to become quite proficient. Emphasis is placed on actual performance of the various diagnostic measures rather than merely observation.

Since the staff of the Wayne University Medical School consists only of specialty personnel, our examinations are done by experts in the various fields, sigmoidoscopic examinations by surgeons, pelvic examinations by gynecologists, laryngoscopies by E.N.T. specialists, and general history and physicals by internal medical men.[3] Although we recognize the merit of general practitioners conducting the clinics, thus assuring the profession that any, well-qualified and interested medical doctor can perform a cancer detection examination, the advantage, from a teaching standpoint, in employing only specialists, is tremendous. Authorities in each aspect of the examination are present to provide the highest caliber staff to the students and practitioners in their course of instruction.

Our examinations are done on a production-line basis, in that the patient is shuttled from room to room for the various parts of the examination and, for this reason, much of the doctor-patient relationship is lost. Teaching is facilitated, however, in that the student may remain in the same station and receive concentrated instruction in one aspect of the examination. During one afternoon, for instance, a student may perform, under the guidance of a gynecologist, a complete pelvic examination, including the preparation of a Papanicolaou smear, on as many as 15 women.

A word should be mentioned regarding the value of educating the public as to what constitutes an adequate, cancer detection examination. We feel that, through the example set by the clinic, the patient will demand from his or her private practitioner an examination equaling that given at the clinic. In addition, the physician is stimulated to perform a more thorough examination because of statistics published by the clinic, demonstrating the value of such thoroughness.

It is our hope that, through these avenues of education, the clinic will set a standard for cancer detection in the community and will educate the doctor, as well as the public, in what to expect from such an examination. This will ultimately increase the effectiveness of cancer detection in the place where the great bulk of detection will eventually be done—the doctor's office.

CHART V

Yates Memorial Clinic

ACCURACY OF CERVICAL-VAGINAL SMEARS—May, 1950 - Dec., 1953

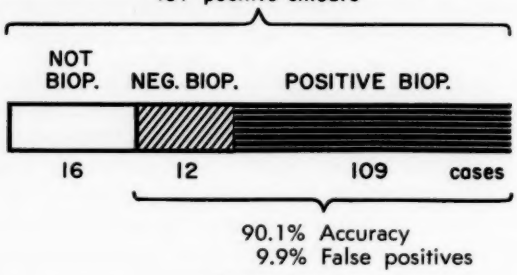
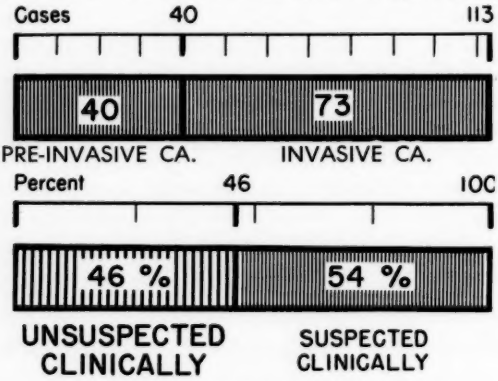


CHART VI

Yates Memorial Clinic—CERVICAL CANCER—May 1950 - Dec. 1953



SUMMARY

1. In this paper is reported the aims of Yates Memorial Cancer Detection Clinic and some of the findings in 15,266 patients, covering a period of operation from May 15, 1950 through December 31, 1953.

2. The incidence of 2 per cent proved malignancies is cited with a breakdown of these lesions according to site.

3. Cytologic diagnosis as a screening method for cancer, particularly of the cervix, is discussed and its accuracy is evaluated.

4. It is emphasized that fifty two cases of carcinoma of the cervix were not suspected on careful, clinical inspection but were diagnosed by smear examination and later confirmed by biopsy.

5. The role of the Yates Memorial Clinic as a graduate training center in cancer detection, in affiliation with Wayne University College of Medicine, is stressed.

REFERENCES

1. Papanicolaou, G. N.: Diagnosis of uterine cancer by the vaginal smear, New York, Commonwealth Fund, 1943.

2. Vincent Memorial Hospital, Boston: Cytologic diagnosis of cancer, Philadelphia, Saunders, 1950.

3. Wilson, G. S., Dale, E. H., and Patton, T. B.: Cancer detection at the Yates Memorial Clinic, J. Michigan M. Soc. 53:382, 1954.

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THE PHYSIOLOGIC BASIS FOR SURGICAL THERAPY OF PEPTIC ULCER[1]

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It is with much pleasure and a sense of nostalgia that I return to the Henry Ford Hospital after eleven years. You have made much progress in this period. Your magnificent new buildings, including this hall in which I am now speaking, are a testimony to this progress. I must pause before proceeding with the main body of my talk to pay tribute to my former chief, Dr. Roy D. McClure. As time has passed, I appreciate his well-rounded excellence in all the compartments of a full life. He was an excellent surgeon and a true gentleman. As I grow older, I marvel at his tolerance of my shortcomings. I try to use his gentle but insistent methods of accomplishing a purpose in dealing with my own residents. I am pleased to see my former associates, Drs. Laurence Fallis and Conrad Lam in positions of increasing responsibility and influence. I miss seeing our well-beloved Dr. Arthur McGraw. As a teacher, it is a welcome sight to see some of the men who were on the Resident Staff in Surgery when I was here, now serving as active members on the Attending Staff and making important contributions to the surgical literature. Among these are Doctors Brush, Szilagyi, Barron and Ponka.

The subject of my talk is "The Physiologic Basis For Surgical Therapy of Peptic Ulcer". I thought it might be of interest to you to have presented a summary of work on this subject performed in one laboratory. For this reason, I will not refer to the important contributions of others in this field but will present only our own investigations, either those of the author or of Dr. K. A. Merendino, of our group.

Our belief is that peptic ulcer is due to excess free hydrochloric acid secretion by the stomach. The old rule, "no acid, no ulcer", is pertinent in this connection. Acid secretion, in turn, is stimulated by 4 mechanisms:

1. Nervous (cephalic, vagal) phase.
2. Hormonal (gastric, antral) phase.
3. Intestinal phase.
4. Adrenal phase.

The relative importance of these phases in the human can be estimated only by inference from studies in experimental animals. A synthesis of results of Sauvage, Schmitz, Storer, Kanar, Smith, and Harkins (1953) and of Dragstedt, Woodward, Storer, Oberhelman, and Smith (1950) indicates that in the normal dog the relative importance of these phases may be: nervous (40 per cent), hormonal (45 per cent) and others combined (15 per cent). The Sauvage pouch is useful in these differential studies and has, we believe, certain advantages over the Mann-Williamson preparation. One of these advantages is that the animals maintain a good nutritional status only in the former, so that with the Sauvage pouch, any resultant peptic ulcers are not on the basis of malnutrition.

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1. From the Department of Surgery, University of Washington School of Medicine, Seattle. This work was aided by grants-in-aid from the National Institutes of Health (Project G-3295). Abstract of paper given before the Henry Ford Hospital Medical Association, Detroit, Friday, Nov. 12, 1954.

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Acid secretion is not only subject to stimulatory, but also to inhibitory regulation. Among the latter influences are:

1. Duodenal inhibition.
2. Sympathetic nerve fibers

In addition, the susceptibility of the gastric or intestinal mucosa to peptic digestion may be considered in any study of the mechanisms of ulceration.

Work done in our laboratory relative to certain of the individual phases of gastric secretion, either stimulatory or inhibitory, will be summarized as follows:

I. *Nerve Phase (Stimulatory)*

1. In the Shay rat preparation (pylorus ligated after 24 hours of starvation, control rats developed an average of 22 ulcers per rat) vagotomy entirely eliminates peptic ulceration.

2. In the Shay rat preparation, adequate doses of Banthine or of atropine also eliminate peptic ulceration.

3. In the Mann-Williamson dog, vagotomy reduces the incidence of stomal ulceration from 85 per cent in the control animals to 11 per cent in the animals with supplemental vagotomy, this decrease in incidence being accompanied by a prolongation of the life of the animals.

4. Banthine and atropine decrease the incidence of stomal ulceration in the Mann-Williamson dog, but do not prolong the survival of such animals.

5. Neither Banthine nor atropine, even in high dosage, has an appreciable effect on the 24 hour, free hydrochloric acid, secretory response after feeding of the Heidenhain pouch dog.

6. Vagotomy of the main stomach causes a significant rise in the volume and the free hydrochloric acid content of the secretion from a Heidenhain pouch.

Discussion: The results listed in 1-4 above are consistent with the view that the vagi mediate the nervous phase of gastric secretion and that vagotomy, or the administration of anticholinergic drugs, abolishes this phase. The results in 5 above are more complicated of interpretation and indicate that interference with the nervous phase has no effect on the hormonal phase, at least in so far as the latter is measured by Heidenhain pouch (pouch without vagal connections) secretion. The results in 6 above are more difficult of interpretation and are believed to indicate a stimulation of the hormonal phase by vagotomy (in addition to the known action of this operation in abolishing the nervous phase) (see II below).

II. *Hormonal Phase (Stimulatory)*

1. Antrumectomy in the Sauvage pouch preparation reduces the incidence of peptic ulceration from 100 per cent in the control animals to 45 per cent following antrumectomy.

2. Gastrojejunostomy (2 types) of the main stomach causes a significant rise in the free hydrochloric acid secretion from a Heidenhain pouch. This stimulation occurs whether the anastomosis is high, medium or low, and is not abolished by vagotomy.

Discussion: The paradoxical stimulatory effect of gastrojejunostomy may explain its relative clinical ineffectiveness when used alone for the treatment of duodenal ulcer. Four possible explanations are offered for the stimulatory effect: (1) Lack of duodenal

inhibition, (2) Increase antral stimulation due to repetitious food passage, (3) Alkaline rebound phenomenon, and (4) Prolongation or intensification of the intestinal phase.

III. *Duodenal Inhibition:*

1. Gastroduodenostomy (3 types) in dogs gives rise to less Heidenhain pouch stimulation than does gastrojejunostomy.

2. Pyloroplasty (3 types) in dogs produces essentially no excess Heindenhain pouch secretion.

3. Dogs with Heidenhain pouches and with the antrum transplanted to the colon secrete more free hydrochloric acid from the Heidenhain pouches when the stomach empties by means of a gastrojejunostomy than when it empties by means of a gastroduodenostomy.

4. Dogs with antral transplants to the colon (Dragstedt preparation) develop stomal ulcers much more commonly when the stomach empties by means of a gastrojejunostomy than when it empties by means of a gastroduodenostomy.

5. Similarly after antral resection and discard, in dogs injected with histamine, the relative incidence of stomal ulceration for the two types of anastomosis is similar to that in III-4, above.

Discussion: On the basis of these studies, we feel justified in continuing our clinical practice of performing a Billroth I (gastroduodenal anastomosis, either end-to-end or Finney-von Haberer modification) gastric resection or a "combined" (partial distal gastrectomy, vagotomy and gastroduodenostomy) resection for most patients with duodenal ulcer. Our overall experience with these procedures involves their performance in 330 cases with what we believe are encouraging results. We are pleased to note that in this Hospital, the same procedures have been used for several years.

IV. *Relative Sensitivity of Different Portions of the Gastrointestinal Tract to Peptic Ulceration*

1. Esophagogastrectomy in dogs, either with or without vagotomy, leads to a high percentage of fatal esophageal ulceration. When the esophagogastric junction is sacrificed, esophageal ulcer and/or esophagitis is a constant finding. "One hundred per cent" parietal cell resections do not prevent serious esophageal complications. (Hoag, Kiriluk and Merendino, 1954).

2. Both Grondahl esophagocardioplasty and long, Heller extramucous esophagocardiomyotomy in dogs are accompanied by a high incidence of esophageal ulceration. Vagotomy in conjunction with either procedure increases the severity of esophageal complications. The short, Heller operation gives less severe changes (Merendino).

3. It was determined in dogs that by increasing the length of the afferent loop in the Billroth II plan of gastrectomy, less buffering capacity is available for the neutralization of acid secretion at the gastroenteric stoma (Merendino).

4. On the other hand, inherent mucosal sensitivity varies little from the distal duodenum to the midjejunum, as determined by gastric anastomosis followed by histamine injections in dogs. Similarly, when segments of the esophagus, mid-duodenum, jejunum and ileum are exposed to a drip of an acid-pepsin mixture, all of these segments are equally resistant, except the esophagus which is much more susceptible (Merendino).

5. The first portion of the duodenum (possibly because of its contained Brunner's glands) is less susceptible to a drip of acid pepsin mixture than is the jejunum.

Discussion: On the basis of these studies, Dr. Merendino is utilizing an operation of jejunal interposition (a segment of jejunum between the esophagus and stomach) in all operations where the cardiac sphincter is destroyed. This operative preparation has been thoroughly studied in experimental animals and is being tested in patients.

V. *A New Operative Preparation for the Study of Gastric Secretion and Peptic Ulceration: The Sauvage Pouch* (vide supra).

SUMMARY

The results of some 19 individual groups of experiments, under the heading of studies of the nervous phase of gastric secretion, the hormonal phase, duodenal inhibition, the relative sensitivity of different portions of the gastrointestinal tract to peptic ulceration and a new experimental operative preparation have been presented.

These experimental studies have been correlated with our clinical experiences with three operative procedures in patients: (1) The Billroth I gastric resection, (2) The combined operation (partial distal gastrectomy, vagotomy and gastroduodenostomy), and (3) The jejunal interposition operation for replacement of the cardiac sphincter (Merendino operation).

BIBLIOGRAPHY

1. Dragstedt, L. R., and others: Quantitative studies on the mechanism of gastric secretion in health and disease, Ann. Surg. 132:626, 1950.

2. Harkins, H. N., and others: The Billroth I gastric resection; experimental studies and clinical observations on 291 cases, Ann. Surg. 140:405, 1954.

3. Harkins, H. N., and others: Combined physiologic operation for peptic ulcer (partial distal gastrectomy, vagotomy, and gastroduodenostomy), West. J. Surg. 61:316, 1953.

4. Hoag, E. W., Kiriluk, L. B., and Merendino, K. A.: Experiences with upper gastrectomy, its relationship to esophagitis with special reference to the esophagogastric junction and diaphragm, Am. J. Surg. 88:44, 1954.

5. Kanar, E. A., and Harkins, H. N.: Experimental assay of operative procedures used clinically for peptic ulcer, West. J. Surg. 61:679, 1953.

6. Sauvage, L. R., and others: Relation between the physiologic stimulatory mechanisms of gastric secretion and incidence of peptic ulceration; experimental study employing a new preparation, Surg., Gynec. & Obst. 96:127, 1953.

EXPERIENCE WITH SOME UNUSUAL DISEASES OCCURRING IN FAMILIES

DR. WILLARD H. WILLIS, M.D.*

The familial incidence of many disease and anomalies is well known. The pattern of heredity in some of these, such as hemophilia, has been well described. From time to time, attention has been called to the familial incidence of some diseases not usually regarded as hereditary. Sarcoidosis has been described in identical twins. Recently, Buerger's disease has been found in a brother and sister, although many instances have been recorded in which brothers had the disease. A colleague of mine recently observed polycythemia vera in identical twins, 7 years of age. The purpose of this paper is not World War II, involving certain unusual and curious disorders occurring in several families. The familial aspects of these have not been emphasized.

DISSEMINATED LUPUS ERYTHEMATOSIS

The familial susceptibility to disseminated lupus erythematosis has received some attention and has been described in two siblings. I will discuss briefly a family of six children, three of whom have died of the disease. The first case died at the age of ten years. She exhibited a typical skin eruption, fever, pallor, purpura, stomatitis and died in spite of supportive measures.

The second case was 20 years old when she died and had been ill for only 9 months. There was a marked anemia, thrombocytopenia and relative leukopenia, prolonged fever, splenomegaly and purpura but did not have the usual skin eruption. Autopsy, however, revealed the usual findings of disseminated lupus.

The third case in this family was 19 years old when she died and the total duration of her illness was only five months. The onset of her illness was characterized by mild joint discomfort and a sore mouth and she soon developed anemia, purpura, splenomegaly and a typical skin eruption over her face, palms and soles. She had a positive Wasserman from the beginning but there was no evidence of syphilis. Here again, autopsy confirmed the diagnosis of disseminated lupus. I should mention that all these cases died before the days of adequate hormone therapy.

The rest of this family has been examined. Neither the father nor the mother have ever shown evidence of the disease and nothing further was known of their ancestors. One sister proved to have a mild, hypochromic anemia and splenomegaly. Her platelet count and bone marrow studies were not unusual, although she did have a mild purpura. The youngest sister, age 14, was shown to have hypochromic anemia, splenomegaly and a reticulocytosis of 4%. Neither of these two girls have subsequently developed sufficient clinical evidence to make a diagnosis. However, these findings suggest that the final chapter in this family's susceptibility to the disease may not as yet be written. The brother presented a normal clinical picture.

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PORPHYRIA

It is well known that porphyria may occur in acquired or familial form. The clinical picture of the familial type has been well described and will not be mentioned. Early in 1948 a young woman was observed to have acute porphyria. She had none of the clinical stigma of the congenital type. She was seen post-operative because she was passing dark urine. She had been operated on because of acute abdominal pain but no pathology was found. She had taken various medications for dysmenorrhea prior to the surgery. The dark urine was shown to contain excessive amounts of porphyrins and she ran a typical course of acute porphyria, including extensive peripheral nerve damage. She made a complete recovery but since that time has had two exacerbations of her disease and, during the interval, has consistently shown abnormal amounts of porphyrins in the urine.

It was learned that her brother had a similar illness. He exhibited no stigma of congenital porphyria. His urine contained abnormal amounts of porphyrins each time that it was examined. His history certainly suggested that he had experienced an acute episode of porphyria. I mention these merely to show that what may appear to be acquired porphyria may be the congenital disease in exacerbation.

MACROCYTIC ANEMIA

Perhaps more interesting than the experiences just related is the observation of three sisters with a peculiar variety of anemia. This anemia has been characterized by chronicity, macrocytosis, an increased number of megaloblasts in the bone marrow, episodes of purpura and thrombocytopenia, a normal hemoglobin content of the cells, the presence of free hydrochloric acid in the stomach, and the failure to show significant response to substances providing the erythrocyte maturation factor, iron or thyroid extract. None have histories to suggest steatorrhea or episodes of hemolysis, and two have failed to respond to splenectomy. None have shown evidence of liver disease. Representative blood counts show some of the similarities. They had all been treated for a period of time by different physicians for the anemia without success. Interestingly enough, they have felt well and carried on normal activities in spite of the degree of anemia. One sister and one brother of these patients have normal counts, as does the mother who is the only living parent.

WOLFF-PARKINSON-WHITE SYNDROME

In 1949 an electrocardiogram was taken on a high school student because of a pulmonic systolic murmur, Grade I. She showed the typical findings of a short PR interval and a prolonged QRS complex characteristic of Wolff-Parkinson-White syndrome. In view of the experiences just related, arrangements were made to take electrocardiograms of her six siblings and of her mother and father. Two of the sisters showed almost identical electrocardiographic patterns. Similar cardiac silhouettes existed in these, as did a soft pulmonic systolic murmur. To my knowledge this is the first known incidence of Wolff-Parkinson-White syndrome occurring in siblings.

Later, the only brother in the family was apparently well, clinically, and did not have a heart murmur or electrocardiographic evidence of the W.P.W. syndrome but dropped dead in school. It is known that sudden death is not uncommon in this anomaly and it is known that it may exist only at times during one's life. He may have actually been the fourth case of the W.P.W. syndrome in this family.

POST-MENOPAUSAL OSTEOPOROSIS

In 1947 a 75-year-old woman presented herself complaining of acute backache. She had experienced chronic backache for years. There was a girdle-like pain over the lower abdomen and x-rays of the spine revealed diffuse osteoporosis with wedge-shaped fractures of several dorsal vertebra. Review of the previous x-rays taken in 1938 showed that the osteoporosis had existed at that time. Appropriate blood and urine chemistry studies were done to exclude osteoporosis other than the post-menopausal type. These were all negative. She made a symptomatic response following estrogen-androgen therapy.

Since that time, two of her three sisters have been observed. One of these sisters had back pain for years and studies established a similar diagnosis of her five, wedge-shaped fractures, noticed in the dorsal and lumbar spine, which were assumed to be spontaneous because there was no history of injury. Her back pain responded to hormone therapy and she was restored to an active life.

The second sister was seen because of a traumatic fracture and there was radiographic evidence of extensive osteoporosis. The third sister, who was not observed, died at the age of 68 in 1934 as a result of a transection of the spinal cord following a pathological fracture of the lumbar vertebra. This may have represented the fourth case of post-menopausal osteoporosis in this family of four sisters although x-rays of the fourth case have not been studied.

SUMMARY

In summary, cases of disseminated lupus erythematosis, so-called acquired porphyria, chronic macrocytic anemia with thrombocytopenic purpura, Wolff-Parkinson-White syndrome, post-menopausal osteoporosis have been observed in two or more siblings. These cases have been discovered during a relatively short period of ordinary practice in internal medicine. This suggests that a survey of the family of patients with an unusual disorder, not commonly regarded as familial, may prove a fruitful source of important and interesting pathology and may even aid in the diagnosis.

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PSYCHOSOMATIC MECHANISMS

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In this presentation is offered a concept pertaining to psychosomatic disorders. This concept is considered significantly different from extant ideas, and, if basically sound, anticipates a revision of current therapy for psychosomatic disorders.

Simply described, psychosomatic disorders have been considered the resultant of autonomic nervous system dysfunction, and this autonomic dysfunction, in turn, is held to be tied in with varied emotional conflicts. Researchers in psychosomatic medicine with a patho-physiological bent, often seek lesions or physiological aberrations in the autonomic nervous system and the associated endocrine system. Researchers with a patho-psychological bent seek central nervous system lesions and/or precise emotional conflicts which are felt to cause autonomic nervous system dysfunction. Although the contributions from such research rank among the highlights of twentieth century medicine, it is considered that both groups have included in the research major premise an erroneous idea; namely, the assumption that in psychosomatic disorder there exists autonomic dysfunction—implicit in which assumption is the idea of a structural or functional autonomic defect.

Basic to the concept herein presented is the recasting of the autonomic nervous system from its role of the villain in psychosomatic disorders to that of overworked hero. Such a concept of autonomic stability requires a relocation of the diseased or mal-functioning organ system, etiologic to the psychosomatic disorder.

Modern neurological and psychological research have afforded the two understandings that lead to the indictment of the true offender; that part of the central nervous system termed the intellect. The first of these is the demonstration of the blind subservience of the autonomic nervous system centers to stimuli from the cerebral cortex. The second is the demonstration of the existence of unconscious mechanisms, which, through a phenomenon termed projection, distort the external environment. That such a mechanism is unnatural is considered self-evident, but the fact that such a mechanism is normal in our society probably would come under the heading of "news" to the majority of physicians and laymen alike.

Unaware of the unconscious mechanism of projection, the conscious intellect misapprehends the external situation. This erroneous estimate of the situation is then relayed to the subservient autonomic centers for appropriate homeostatic action. The internal milieu so created is a sound physiologic response to the misapprehended situation, but by its very inception, an unsound adaptation to the real environment. This phenomenology could be paralleled to the activities of a strong, blind servant following the dictates of his misadvised master.

If the foregoing concept of autonomic stability be considered sound, then such procedures and drugs currently directed towards the correction of autonomic dysfunction can only be leading to the compounding and confounding of psychosomatic

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phenomenology. From a perusal of medical literature and from the laboratory of active medical practice come three common sense evidences considered supportive of the current thesis:

First, the universal view of practicing physicians that people with psychosomatic disorders are nervous, worrying and tense people, an observation directly incriminating the cerebral cortex. Second, despite indefatigable research inquiries seeking anatomic or physiologic defects of the autonomic nervous system, the integrity of this system remains unassailed. Third, the compounding of cortically acting drugs, such as barbiturates, into proprietary products intended for the correction of so-called autonomic dysfunction, is considered to represent a subtle, yet significant, indictment of the cortex.

Having defined the primary lesion in psychosomatic disorders as being cortical in location and functional in character, it is apparent that sound therapy will be that which corrects the etiologic, intellectual dysfunction. Assuming the correction of this dysfunction by psychotherapy which is sound and effective, the result will be a return to appropriate homeostatic mechanisms, which in itself spells out a healthy individual. There will be two groups of patients wherein the assumed sound and effective psychotherapy will not reverse the symptomatology. In one group of such patients, long standing inappropriate adaptive mechanisms will have resulted in fixed structural changes in the adaptive organ, for example, the blood vessels in essential hypertension. In the second group the intellect has so confused the external and internal milieu that its integrative conclusions are either an ineffectual hodge-podge or a fixedly, misadvised pattern. In such an individual, that is the psychotic, the psychotherapist, as part of the external environment, is misapprehended along with the rest of the external milieu and, hence, ineffective.

Sound and effective psychotherapy will be that which corrects the intellectual dysfunction; more precisely, corrects the projection mechanism which cornerstones the intellect's difficulties. For the physician to correct the psychopathological mechanism of projection he must have a sound understanding of the structure of projection itself; for, if psychotherapy is to be effective, the patient must be taught the structure of his projections in order to be able to realign his intellect. The key to such comprehension appeared when Freud (and others) brought into medicine the knowledge that man had unconscious, conditioned reflexes. Through their contributions it was learned that the individual had motivations and feelings which the intellect did not recognize as being inside the individual; for unconscious simply means feelings and attitudes within an individual that are not known by the intellect to be a part of that individual. This understanding, in turn, facilitated recognition of the fact that behavior is initiated by need stimuli generating in the internal milieu. Excepting instinctual behavior, such needs bring themselves to the attention of the intellect, which in turn scans the external environment for opportunities allowing satisfaction of the need. It is the further function of the intellect to determine the behavior response most appropriate in the light of its inside-outside appraisal.

In projection, the intellect is made aware of a feeling or a need and, ignorant of the fact that the stimulus arises inside, it appraises its origin to be the only other place possible—outside. When an inside drive is experienced as being outside, the energy vector is changed one hundred and eighty degrees. For example, if an individual

has x units of anger directed towards the environment and finds this anger not in himself but in his environment, the result is that he feels the environment to have x units of anger toward him. Having once so misappraised the environment, all further efforts by the intellect will be maladaptive behavior. It is to be noted that even in the most sick of mentally ill patients, the intellect functions logically if one excludes the original defect of misapprehending the inside-outside situation by projection.

When the intellect is performing its function as just described; then, in the framework of human relationships, it can misapprehend the feeling of another person. As in the example given before, failing to recognize the intra or inside location of the anger, it will apprehend it outside in another person to be angry. When the intellect in such a situation then decides on defensive action, it is apparent it is gearing the individual to fight his own angers. In this example it can be seen that projection makes intra personal feelings appear to be inter personal.

Human relationships are intrapersonally determined and experienced—not interpersonally. Where an individual fails in his human relationships, it is not a problem between himself and others, but rather a problem within himself. By the mechanism of projection this intra-personal conflict feels inter-personal.

A corollary of the mechanism of projection is found in the fact that most, if not all, individuals believe they can feel the feelings of others. The fact that anatomy and physiology have failed to locate such a receptor organ in the human body should have led long ago to serious questioning as to how such a belief comes about. This, in turn, could only lead to understanding that in his ignorance the individual has found a part of himself outside himself.

Two simple formulas allow for the determining of what internal motivations or behaviors are being projected by the individual. First, whatever behavior any individual heatedly criticizes in any other individual, such patterns will be the unconscious patterns of the decrier. Such is the succinct wisdom of, "Let he without sin cast the first stone". Second, whenever an individual feels driven by other individuals to act in manner A, B, C, or D, such will be his own drives to act in manner A, B, C, or D. He has simply by the mechanism of projection made an intra-personal drive an interpersonal feeling and, in so doing, changed the drive vector one hundred and eighty degrees. Having so determined the projected material, the goal of therapy is simply to bring the products o fthese formulas to the awareness of the intellect. This is considered to be no more than a re-educative process.

In summary, there is presented in outline an understanding of the role of the autonomic nervous system in psychosomatic disorders, along with what is considered to be a new construct of intellect dysfunction and its therapy.

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SOME PRACTICAL APPLICATIONS OF PULMONARY FUNCTION STUDIES IN CHEST DISEASE

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The study of pulmonary physiology has become one of the most rapidly growing fields of investigation in recent years. For the practicing physician, an evaluation of the clinical usefulness of lung function tests has become increasingly difficult, owing to the continuing introduction of new methods and greater complexity. Two questions about such studies are commonly asked. These are, first, what is the single most useful test of lung function; and second, under what circumstances should functional evaluation of the lungs be undertaken?

To answer these important questions adequately will be impossible in this brief discussion. However, an understanding of a few general points will help to clarify the problem.

First, tests of pulmonary function in current use have certain clear-cut limitations. As in the case of measurements of liver or of renal function, they quantitate the ability of the organ to perform its physiologic task. They do not record anatomic changes; nor do they locate the *site* of a lesion within the lung. Similarly, they usually will not provide an etiologic diagnosis of the abnormalities found. They may show no significant alterations in localized lesions which produce little interference with either ventilation or perfusion of the lung. Thus, certain conditions of great clinical importance, such as carcinoma, lung abscess, or tuberculosis, may be undetected by physiologic studies. On the other hand, diseases with airway obstruction, and often relatively little abnormality on routine chest films, may produce marked alteration in function.

Pulmonary functions tests are concerned chiefly with the measurement of disability resulting from disease of the lungs, and of reserve available in times of stress. Thus, they are particularly useful in the evaluation of patients in whom major thoracic surgery is contemplated; in the quantitation of degree of impairment, and the determination of its physiologic cause, especially where medico-legal problems may be involved; and finally, in assessing response to therapy in chronic pulmonary disease, and in following its course by serial observations.

The multiplicity of current tests of lung function reflects the complexity of the work of the lungs, the primary function of which is to carry oxygen into the blood and excrete carbon dioxide. Many processes are integrated together to produce the end result; thus, no one determination can give a complete picture of the whole. Two relatively simple tests, however, will supply considerable information, and have been found in most instances to be well correlated with patient disability. These are the maximum breathing capacity—the maximum amount of air which can be moved in and out of the lungs in a given period of time—and the timed vital capacity, usually measured in a three second interval and calculated as percent of the total vital capacity. Using these baseline studies in conjunction with a careful history, physical examination, and chest fluoroscopy, a fairly accurate estimate of function can be made in the majority of cases. In addition, these tests often show certain patterns of abnormality

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which help, for instance, in the detection of pulmonary emphysema, and in its differentiation from various types of pulmonary fibroses, with which it is often confused.

Chronic obstructive pulmonary emphysema is perhaps the commonest, and also the most crippling of chronic chest diseases. It may exist by itself, but frequently complicates other chronic pulmonary disease. Detection of its presence, and accurate evaluation of its effects are essential for several reasons. The presence of obstructive emphysema is often the chief factor in disability. Patients with emphysema present a considerably increased risk for operative procedures; they tolerate anesthesia poorly, and have great difficulty raising secretions post-operatively. In addition, the dangers of over-sedation, and of therapy with high concentrations of oxygen in these patients are becoming increasingly well recognized.

Spirographic studies in these individuals reveal an abnormal pattern which is usually quite distinct from that generally found in pulmonary fibroses.

The following two cases demonstrate characteristic findings in such instances.

The first was a man of 50 with a typical story of moderately severe dyspnea on exertion, gradually increasing over several years. Cough and wheezing were also prominent symptoms at certain times. Chest films showed little abnormality in the parenchyma, although the hemi-diaphragms exhibited the flattened configuration usually seen in emphysema. Function studies revealed:

1. A prolongation of the vital capacity curve with a delayed return to the baseline.
2. Diminished vital capacity, with the ratio of the three second to the total capacity considerably decreased.
3. Greater decrease in maximum breathing capacity than in vital capacity, indicating inability to move air in and out rapidly.
4. Normal oxygenation of the blood at rest, as demonstrated by arterial blood studies; and the same during exercise, in spite of severe dyspnea—showing that the dyspnea was not secondary to hypoxia.

The figures obtained may be summarized as follows:

	Predicted	Determined	%
Total vital capacity	3850 cc.	3040 cc.	79
Three second vital capacity	95% of total	65% of total	—
Maximum breathing capacity	104.5 L/min.	36 L/min.	35

Thus we have the picture of diffuse airway obstruction as the outstanding abnormality, with no impairment of the blood oxygenating mechanism under the conditions of the test.

In sharp contrast to the foregoing were the findings in the next case. This patient was a man of 52, who also had noted gradually increasing exertional dyspnea over a period of several years. Serial chest films made as part of a routine yearly examination at his place of work over a ten year period revealed diffuse bilateral parenchymal densities which had become gradually more extensive during this time. During these years, the man had been employed in an industry manufacturing a cobalt alloy, but as far as could be determined no exposure to silica was present.

The most striking features on physical examination were marked clubbing of the fingers, and a pronounced tachypnea in response to exertion, without, however, the labor and discomfort of breathing observed in the previous patient. Function studies

differed distinctly from the preceding, and were, in general, representative of those found in other diffuse pulmonary fibroses of various types. The oustanding abnormalities were:

1. Marked decrease in vital capacity, as well as tidal air, indicating a restricted thorax.

2. Normal ratio of the three second vital capacity to the total—over 95%.

3. Maximum breathing capacity much less reduced than the vital capacity, indicating an absence of significant airway obstruction.

4. Studies with the oxyhemograph, or oximeter, revealed a marked fall of arterial oxygen saturation during exercise; however, no fall occurred during the same exercise while breathing 100% O_2, thus indicating the absence of any significant shunt of pulmonary blood from right to left.

The values obtained for vital capacity and maximum breathing capacity were as follows:

	Predicted	Determined	%
Total vital capacity	3620 cc.	1620 cc.	45
Three second vital capacity	95% of total	95% of total	
Maximum breathing capacity	99 L/min.	75 L/min.	76

The findings in this case are characteristic of those occurring in a patient whose primary problem is diffuse pulmonary fibrosis, resulting in a reduced lung volume, restricted ability to move the thoracic cage and lungs, and little or no airway obstruction. As in chronic emphysema, dyspnea or tachypnea is apparently unrelated to impaired oxygenation of the blood. In both these instances, relatively simple pulmonary function studies helped to delineate the character of the abnormalities present, and to quantitate the degree of impairment.

Careful studies of such specific alterations of function often have direct therapeutic implications. The management of the patient with chronic pulmonary emphysema may differ considerably from that of the patient with pulmonary fibrosis. Such matters as the proper use of O_2, the administration of bronchodilators, and the employment of steroid therapy, may be directly influenced by the primary type of underlying physiologic defect. Furthermore, the presence of a pulmonary fibrosis, in particular pneumoconiosis, does not necessarily imply a disability. When dyspnea supervenes, it is often an indication of the presence of a complicating emphysema, which is best measured by appropriate function studies.

More recent research in the field of pulmonary physiology involves studies of diffusion across the alveolar membrane and of ventilation-perfusion relationships within the lungs; measurements of the elasticity of the lungs; and determinations of the work involved in the mechanical act of respiration. All of these studies attempt to obtain fundamental information about the physiology of the lungs and to establish the nature of any defects which may be present. Like other basic studies, their usefulness to clinicians will depend on careful interpretation and understanding of the limitations of the methods involved. In any case, it is clear that judicious application of tests of pulmonary function will play a role of growing importance in the future management of clinical problems.

ABSTRACTS OF RECENT PUBLICATIONS OF THE PROFESSIONAL STAFF OF THE HENRY FORD HOSPITAL AND THE EDSEL B. FORD INSTITUTE FOR MEDICAL RESEARCH

INTERSTITIAL CYSTITIS: AN ADJUNCT IN ITS TREATMENT. A. WAITE BOHNE AND ROBERT J. FETZ. Arch. Surg. 69:831, 1954.

Interstitial cystitis is a disease with a primary predilection for the female. It begins insidiously in the third decade of life. By the fourth to the sixth decade the syndrome is at its height, adding wretchedness to the already nervous, uncertain and depressed menopausal woman. The symptoms, frequency and suprapubic pain are the result of gradual fibrosis and contraction of the bladder. To relieve these, a device has been developed, consisting of an 18 F. whistle-tip, straight, rubber catheter, to the end of which is attached a distensible, 1/5,000-in.-thick, condom-type, rubber bag. The bag has a capacity of 1,000 cc., so that the danger of rupture is minimal and reflux of the distending medium nonexistent. Using sterile precautions, the catheter bag is inserted into the empty bladder. The bag is then gradually distended with water until the desired capacity is reached. In none of the patients with reflux so treated has there been evidence of upper tract infection following distention. The use of this device certainly seems indicated to prevent further complications in these already wretched and unhappy people.

OSTEOARTHRITIS AND RHEUMATOID ARTHRITIS. DWIGHT C. ENSIGN AND JOHN W. SIGLER. GP 11:62, 1955.

Much can be done for individuals with osteoarthritis and rheumatoid arthritis. Osteoarthritis is the "wear and tear" type usually developing with aging local joint injury and excessive strain. It is always advisable to correct obesity and faulty posture. Numerous measures are given in detail which may be useful in controlling symptoms in the knee and hip. This condition in the spine must be approached with a diagnostic study to include nerve compression, herniation of the nucleus pulposus, rheumatoid spondylitis and osteomatous lesions. Rheumatoid arthritis is a systemic, crippling joint disease. Joint involvements are multiple, usually symmetrical, and fluctuate in intensity. In the acute phase there may be fever, lymph adenopathy and joint effusion. In the chronic case, weakness, atrophy, loss of joint motion and ankylosis are present. Special medication may include gold salts, steroids or a combination of these. Phenylbutazon must be considered. Every detail of the patient's physical, psychological and spiritual life must be considered and enlisted for a successful outcome.

A NEW ILEOSTOMY-COLOSTOMY DEVICE WITH A DISPOSABLE PLASTIC BAG AND NO CEMENT. J. DEWITT FOX AND BROCK E. BRUSH. J.A.M.A. 156: 1398, 1954.

The Royal Ileostomy Appliance, a device for artificially collecting the fecal stream after ileostomy or colostomy, has met with complete patient acceptance. It has been successfully used on 300 patients ranging in age from 18 months to 85 years. It meets the ideal criteria for such a device: it is convenient, cementless, odorless, disposable, lightweight, nonallergenic to skin or mucosa and fits body contours smoothly. This device is presented as an advance in the postoperative care of the patient who has undergone ileostomy or colostomy which should make this type of operation a minimal handicap and inconvenience to the patient.

THE EFFECT OF ACTH ON THE INTEGRITY OF ANASTOMOSES OF THE COLON. THOMAS GEOGHEGAN AND BROCK E. BRUSH. Surg., Gynec. & Obst. 100:30, 1955.

There has been considerable interest in the relationship of treatment with ACTH and cortisone to the healing of wounds since the first reports of retarded wound healing in patients on ACTH therapy. Investigations with granulating wounds in rabbits and mice indicate that ACTH retards the healing of wounds. Experiments on skin wounds, healing *per primam* in guinea pigs and rats, and on skin wounds and cardiovascular suture lines in dogs, failed to demonstrate significant differences in the healing of wounds of control animals and those treated with ACTH and cortisone. The effect of ACTH and cortisone on anastomoses in the gastro-intestinal tract is important for obvious reasons. Suture line leakage was not observed in a series of 10 dogs given large daily doses of ACTH following end-to-end anastomoses of the colon. The strength of the suture lines was not significantly altered by ACTH administration, as compared with nontreated controls. The histologic characteristics of the anastomoses of treated and nontreated animals did not differ. No correlation was evident between the amount of ACTH given and the strength or appearance of the anastomoses.

STIMULATION DEAFNESS: A STUDY OF HEARING LOSSES RESULTING FROM EXPOSURE TO NOISE OR TO BLAST IMPULSES. S. E. LINDQUIST, W. D. NEFF AND H. F. SCHUKNECHT. J. Comp. & Physiol. Psychol. 47:406, 1954.

In the cat as in man, after exposure to wideband noise at high intensity or to explosive sounds such as produced by small arms fire, the frequency range for which hearing losses occur is centered around 4000 c.p.s. and extends one or two octaves above and below this frequency, depending upon the degree of exposure. When the hearing loss is permanent and severe, degeneration of sensory cells in the upper basal and lower middle turns of the cochlea may be found upon post-mortem, histological examination. When hearing losses are less severe (30 to 40 db or less), clear damage to sensory elements in the cochlea cannot always be detected. Some disruption of supporting cells of the organ of Corti may occur and the hair cells may appear slightly distorted and less well defined than in the normal ear. In the present study, individual differences were not systemically studied, but the evidence obtained suggests that there is considerable variability among animals in susceptibility to and recovery from temporary and permanent hearing losses, which may be produced by intense acoustic stimuli. From a practical standpoint, a most important problem is to determine the effects of repeated exposures to sounds which do not produce permanent damage to the ear at a single exposure. The fact that we have in the clinical literature such terms as "boilermaker's deafness" and "aviator's notch" is, in itself, evidence that permanent hearing losses are common in occupations where repeated exposure to high noise levels occurs. But we do not know whether the losses are the result of repeated exposure to sounds at a "sub-damaging" level or of occasional exposure to peaks of sound at intensities above the ordinary level. Nor do we know how important the factor of recovery between repeated exposures is. Our experiments with cats do not provide direct evidence bearing upon these problems, but they suggest that similar intracochlear changes underlie both reversible and irreversible hearing losses.

MEDICAL AND SURGICAL MANAGEMENT OF DIVERTICULITIS IN GERIATRIC PATIENTS. Robert J. Priest, Brock E. Brush, and Louis J. Gregory. J. Am. Geriatrics Soc. 3:55, 1955.

In a review of a ten-year experience at the Henry Ford Hospital there were found 2162 patients with diverticula of the colon. In 169, diverticulitis was diagnosed and 124 treated medically, 45 surgically. Surgical intervention was indicated for perforation, abscess formation, obstruction, fistula formation, hemorrhage, diagnosis of malignancy and, in some cases, for failure to respond to medical treatment. The incidence of diverticulitis has increased with the changing age pattern of the population. Conservative medical management is recommended for uncomplicated diverticulitis in geriatric patients. The intestinal obstruction noted in 26 per cent of the patients responded to conservative therapy, including intubation and antibiotics. The complications of diverticulitis which required surgical intervention are discussed and the operative procedures outlined. The procedure recommended for most geriatric patients with surgical complications of diverticulitis is a three-stage resection of the involved segment of colon.

THE CONTROL OF CERTAIN CARDIAC ARRHYTHMIAS WITH ISOPROPYLNOREPINEPHRINE. E. E. Schumacher, Jr., and C. L. Schmock. Am. Heart J. 48: 933, 1954.

For many years sympathomimetic substances have been studied in an attempt to establish their role in the management of cardiovascular disorders. Recently, a new member, isopropylnorepinephrine (I. P. N., Isuprel), has joined the group and is now being subjected to intensive evaluation. I. P. N. differs from the parent compound, epinephrine, in that an isopropyl group has been substituted for the methyl group in the chemical structure. The new amine has been found to possess many pharmacologic similarities as well as important differences from epinephrine. In our series of 28 patients treated with I.P.N. certain consistent results have been observed. There has generally been a rise of 10 to 20 mm. Hg. in the systolic blood pressure and a similar drop in diastolic pressure. In cases of complete auriculoventricular block, the rate of the pacemaker has always increased considerably and has, with one exception, relocated in the vicinity of the auriculoventricular node. When dissociation persists both the auricular and ventricular rates have increased simultaneously, although not always to the same degree. In cases without complete heart block I.P.N. exerted its primary effect upon the sinus area, although a definite action on the auriculoventricular node was also observed. In no case was ventricular fibrillation or ventricular tachycardia induced by I.P.N., although the latter was abruptly halted in two patients. Some depression of the S-T junction was noted in Cases 5 and 6. The etiology of this change has not been definitely established. No definite changes were noted in the T waves. Several patients developed palpitation with 0.2 mg. of I.P.N. subcutaneously, but no patient experienced feelings of air hunger or substernal oppression. The use of I.P.N. in patients having ventricular tachycardia in connection with Morgagni-Stokes-Adams syndrome is reported. One of these patients, as well as those with hyperactive carotid sinus syndromes, has been maintained on sublingual I.P.N. for period for three or four months with good results. I.P.N. would now appear to be the drug of choice in these conditions.

SEGMENTAL AORTO-ILIAC AND FEMORAL ARTERIAL OCCLUSION; TREATMENT BY RESECTION AND ARTERIAL GRAFT REPLACEMENT. D. EMERICK SZILAGYI AND PAUL R. OVERHULSE. J.A.M.A. 157:426, 1955.

During the past two and one-half years, 27 cases of insidious segmental arterial aortic-iliac and femoral occlusion were observed. Segmental arterial occlusion, unassociated with diffuse arteriosclerosis, has distinguishing clinical features that often make possible its differential diagnosis on clinical grounds alone. Angiography is important in the clinical study and especially in the preoperative investigation of segmental arterial occlusion. During a follow-up observation of from three weeks to 11 months in 14 cases of segmental arterial occlusion involving 19 operative procedures, resection and homograft replacement yielded good results (functionally patent grafts and relief of symptoms) in 76% of the instances. Even when this form of treatment was not successful the condition of the affected limb was not made worse by the operation. Resection with arterial homograft replacement thus appears to be a promising method of treatment of segmental arterial occlusion. Graft material was procured from routine autopsies, chemically sterilized with beta-propiolactone and stored up to 28 days in Hank's solution.